

AMERICAN ARTISAN

The Magazine of

Warm Air Heating
Air Conditioning
Sheet Metal Contracting
Ventilation and Dust Removal

DECEMBER 1961

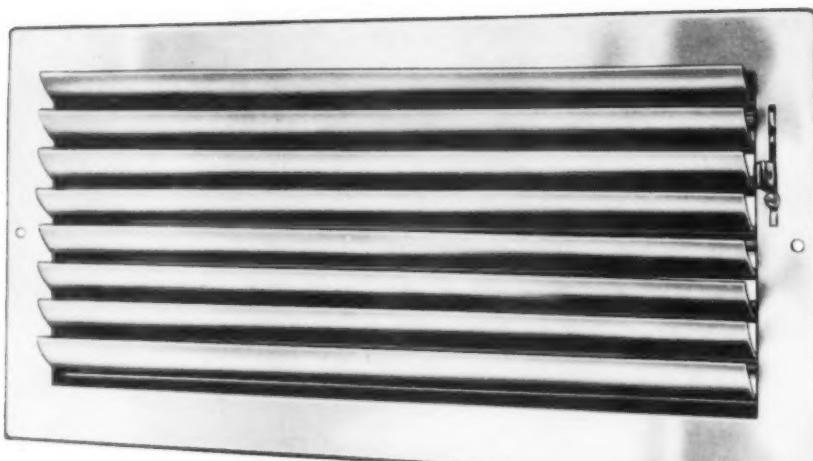
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AIR
CONTROL

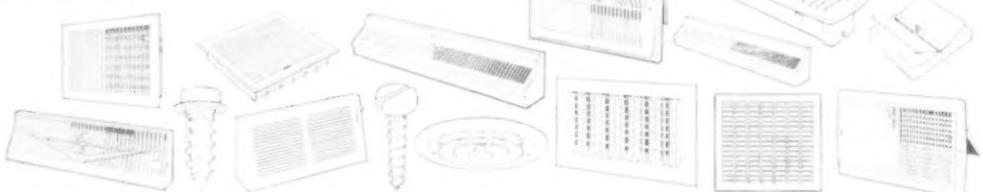
Curved Aluminum Blade

**REGISTERS
and GRILLES**

*Engineered for the toughest specs...
Priced for the lowest bid!*

Air Control's new 200 Series Curved Aluminum Blade Registers and Grilles are ideal for a wide range of heating/cooling applications—for ceiling, high sidewall or low sidewall installation. A variety of blade arrangements is available for 1, 2, 3 or 4-way deflection. Spring tension holds blades firmly in any position and allows an unlimited number of easy adjustments. Multi-louver valve accurately controls air volume and is ideal for shallow-duct installations. Exclusive Adjusto-Stop permits convenient balancing at the register face.

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West Coast Warehouse: Leigh Industries (California), Inc., 649 S. Anderson Street, Los Angeles, California. MADE IN CANADA BY: Leigh Metal Products Ltd., 72 York Street, London, Ontario. Western Sales Agency: E. H. Price Ltd., Winnipeg, Regina, Calgary, Edmonton, Saskatoon, Vancouver

WANT PEAK PERFORM- ANCE AIR CONDITION- ING*

Buy Sporlan *Catch-Alls*...  ... *See-Alls* ... 

Solenoid Valves ...   ... Thermostatic Expansion
Valves ...  and Refrigerant Distributors ...  

They're the Perfect Combination for any size installation!

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 - the amazing See-All... the first combination moisture and liquid indicator
 - a Sporlan solenoid valve with a moisture proof layer wound coil
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 - and... a Refrigerant Distributor with the versatile interchangeable nozzle

See your Sporlan Wholesaler today... he'll be glad to fill you in on all the details!



AMERICAN ARTISAN

- Warm Air Heating • Sheet Metal Contracting
- Air Conditioning • Ventilation and Dust Removal

December 1961

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Upgrade your prospects and profits



there's GOLD in this Mueller Climatrol Electric Humidifier

Declare a bonus for yourself. Sell the Mueller Climatrol 50-810 Electric Humidifier. You won't find a more profitable option that's easier to sell or easier to install. Add it to existing installations or new ones—the 50-810 is a nice bonus for very little extra selling effort. You'll find it's the perfect product for off-season selling, too.

SELL PERFORMANCE — Humidification is positive, automatic, controlled — doesn't depend on amount of heat from the furnace. 800 watt "Incoloy Sheath" heating element adds up to 28 qts. of moisture to the air daily — enough for a 2000-sq. ft. house.

SELL CONVENIENCE — Customer controls the 50-810 by setting dial on unit or setting optional Humidistat Control in living area. Double-liner reservoir pan catches scale that may accumulate in hardwater areas. Aluminum inner pan can be removed and replaced without getting fingers dirty.

FEWER CALL-BACKS — We've eliminated the two most troublesome elements: (1) needle valves that clog, and (2) floats that leak or disintegrate. Water level is electrically controlled by a solenoid valve for continuous operation night and day.

MC-108

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... and quality means profit!*



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the editor's notebook

Thumbing Through This Month's Artisan

. . . we find the suggestion that, in much the same manner as taking an annual inventory, the successful air conditioning dealer-contractor will take stock of his technical knowledge. In his article, *Here Are Answers to 12 Typical Summer Air Conditioning Problems*, Mr. Reid lists problems that practically everyone in the air conditioning field will encounter over a period of time. Questions such as "Will Blower Handle Cooling Load?", "One Room Doesn't Cool. Why?", "What Is Correct Head Pressure?", "How to Avoid Drafts?", etc., are answered briefly and clearly. These questions and their solutions will also serve as a basis for subjects that will be covered in detail in articles scheduled for future issues of American Artisan.

Inventory

. . . is but one of the many problems faced by the dealer-contractor located in a small community, according to James W. Ridgway of Frankfort, Ind. How he solves the inventory problem is explained in *Here's How Small City Dealer Maintains Inventory*. Maintaining equipment for which there are no replacement parts, because the equipment is no longer manufactured, demands competent servicemen who must be capable of improvising suitable repairs or adapting currently produced equipment to restore the equipment to service. To keep the service staff well trained, he holds weekly meetings to discuss methods of diagnosing equipment malfunctions and procedures for making repairs. These weekly meetings have resulted in a number of suggestions from employees which have helped

comfort through '62

with

AIR-EASE



- **quiet**
- **compact**
- **efficient**
- **serviceable**

Whether cold and snowy or hot and humid—"AIR-EASE" is the symbol of year 'round comfort.

In 1962 "AIR-EASE" offers a complete line of quality heating and cooling equipment at highly competitive prices.

Investigate and see what "AIR-EASE" offers you in 1962.

WRITE FOR INFORMATION AND NAME OF NEAREST DISTRIBUTOR

THE JOHNSON FURNACE COMPANY

2129 WEST 117TH STREET, CLEVELAND 11, OHIO

the editor's notebook

(Continued)

streamline all phases of the company's operations.

Mr. Ridgway uses the service skill of his staff as a sales tool. Contacts he makes through memberships in fraternal orders, church and other local groups lead to many of the company's sales. Increased sales help to turn inventory over at regular intervals, with the result that a larger inventory can be maintained because of the savings effected through quantity purchases.

Fabricating

. . . a curved metal covered canopy poses a number of intricate problems for the sheet metal contractor. L. H. Sohn, Chicago, explains in *How to Fabricate a Curved Canopy* the methods he used to fabricate 220 arched canopies to provide protection for apartment house entrances in a new public housing project. How he fabricated the panels, side and end pieces for joining with standing seams is explained in a step-by-step sequence. Development of several special tools aided shopmen in producing the canopies as the schedule specified. One of the special tools was a curved hand dolly which enabled the mechanic to mallet the standing seams against a weighted surface that duplicated the shape of the seam.

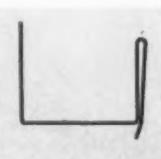
Infiltration

. . . and its effect on the humidity level of a residence is covered in the fourth and last of the series on humidity which began in September American Artisan. This article points out that outside air factors such as air temperature, moisture content, wind direction and velocity all influence the relative humidity level that can be maintained inside a build-

new machines from **LOCKFORMER**

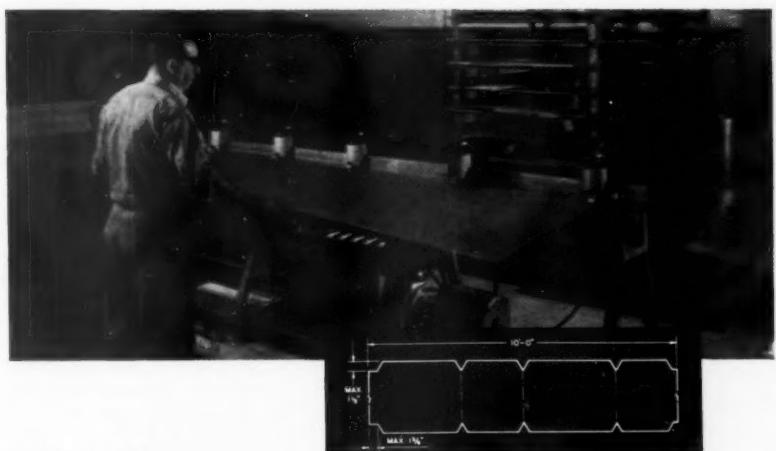
New Lockformer CLIPROL

Produces government cup clips (pocket locks) uniformly and accurately at production speeds of 70 to 80 fpm., and at very low unit cost. Saves up to 40% of the time and labor needed to fabricate clips by ordinary hand brake methods. Models available for 1½" and 1¾" standing seam . . . 22 ga. galvanized or .040" aluminum.



New Lockformer SPEEDNOTCH

Gangnotches without layout or scribing—up to 600% faster than by hand methods. The perfect tool to prepare ductwork to receive government cup clip (pocket lock), bar, slip or "S" and drive connections. Instantaneous setting for up to 5 notches in pieces up to 16 gauge mild steel. Profitable even on a single-piece set-up.



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Write today for a complimentary copy of our new catalog . . . with detailed specifications on the new machines shown above and complete information on other time-saving, money-making Lockformer equipment. The Lockformer Co., Dept. A, 4615 W. Roosevelt Rd., Chicago 50, Ill. In Canada: Brown Boggs Foundry & Machine Co. Ltd., Hamilton, Ontario.



the editor's notebook

(Continued)

ing. In *To What Degree Does Infiltration Affect the Humidity in a House*, examples of how both the crackage method and estimated air change method are used to determine the humidifier capacity best suited to meet the needs of a particular structure are given.

Data tables are presented that show inside conditions recorded in different rooms of a house on days when outside temperatures were 8 below zero, 5 F and 11 F in Madison, Wis. The data are applicable to other locations where such temperatures are normal during the winter.

Reading a "Must" In Fast-Changing World

IT'S A LITTLE BIT difficult to keep up with the fast moving events taking place all around us. Recently I read a report from the U. S. Department of Commerce describing an "ultracompact nuclear power plant that could be assembled on earth, transported by rocket, and operated on the moon." Capable of full-power continuous operation for two years with automatic control, the plant would be used to furnish energy for lunar spacecraft refueling stations, television relays, and stellar and physical observatories.

Even as recently as a few years ago, this would have seemed to be material lifted directly from the pages of a science fiction magazine. Yet the report goes on to say that such a plant "can be regarded as one which can be constructed at the present time with little or no development, and, therefore, can be a starting point for more advanced concepts."

This is an excellent illustration, I think, of the rapidity with which the future (even what seems like the distant future) may become

INDEPENDENT

"Perimeter" REGISTERS

For Baseboard Heating or Cooling



STYLE NO. 40

Two-piece design, solid back frame that does not require a stack head. The circulating air is evenly distributed in a fan-shaped pattern, so that it moves out and up closely paralleling the wall surface. Three sizes — for 2 1/4" x 10", 2 1/4" x 12" and 2 1/4" x 14" openings. Overall size 18 1/2" x 4 1/4". Base extension 3 3/4". Open area 23 sq. inches. Furnished in prime coat or Fabritone finish.



STYLE NO. 60-A

For Floor Installations

The grille faces of these registers for floor installation are the famous "Fabrikated" construction, excelling in rigidity, open area and attractive appearance. Face bars made of solid steel bands #14 ga. x 1/8" deep, mill edges. Bars individually adjustable if desired. An adjusting screw allows air flow to be directed toward outer wall when valves are set in the correct position.

Always Leading — Always Progressing

**THE INDEPENDENT
REGISTER CO.**
3747 E. 93rd STREET • CLEVELAND, OHIO



the editor's notebook

(Continued)

the present. Just to keep up with the times, to meet the new problems which our changing technology is constantly presenting, it is becoming more and more necessary to develop the habit of reading, to look to sources of information such as business magazines to keep us up to date on new methods and new developments that are continually taking place.

Scents Now Mean Dollars to Industry

THE EVER-EXISTENT problem of what to do with exhaust air from industrial plants is gradually becoming more and more acute for the ventilating contractor as employees — and neighbors — get accustomed to air conditioning and the absence of objectionable odors caused by some industrial processes.

Often it isn't economical to provide elaborate deodorizing of air to be discharged into the atmosphere surrounding a manufacturing plant. In cases where objectionable odors must be removed from exhaust air, the use of an industrial aromatic fragrance may be the economical answer. There are now about 20 firms that specialize in producing solutions that neutralize or mask objectionable industrial odors.

It is estimated that the sale of industrial and commercial aromas now grosses about \$100 million dollars per year.

One recent case where an industrial fragrance was effectively used was at a Wildwood, N.J., chicken feed factory. Nearby residents were threatening legal action, property values were falling, and tempers were short. The answer — found by an aromatics firm — was the addition of a counteracting agent to the exhaust air.

Another case involved the



ABC Ships its Millionth Automatic Burner

With government spending in billions, a mere one million may be unimpressive. And, expressed in dollars it would be.

But counted in automatic oil burners we believe it has special significance for the manufacturers of domestic boilers, furnaces and water heaters who combine our burners—under private label—with their equipment.

Continuous and often exclusive use of ABC burners on the part of these manufacturers attests excellent engineering on the part of

ABC's experienced staff; holding to critical tolerances in manufacture; painstaking assembly; and rigid quality controls through factory testing.

We are proud of our association with America's leading manufacturers of domestic heating equipment—and, on the advent of our millionth burner—renew our pledge to continue the kind of production that assures the minimum of service calls and the maximum of trouble-free customer satisfaction.

There is an ABC Burner for every domestic heating need



AUTOMATIC BURNER CORPORATION
1823 CARROLL AVENUE • CHICAGO 12, ILLINOIS

The world's largest producer of private brand oil burners selling exclusively to manufacturers of heating equipment

the editor's notebook

(Continued)

buses of the Cleveland Transit Co. Exhaust fumes were making customers choke and shed tears until a special compound "sweetened" the fuel.

Pension Fund Assets Show Steady Rise

THE POPULARITY of pension funds continues to grow. I learned recently that the book value of trusted pension fund assets of U.S. corporations totaled \$28.7 billion at the end of 1960, which is an increase of \$3.4 billion over 1959. This compares with increases of \$3.2 billion and \$2.8 billion in 1959 and 1958, respectively.

Total pension fund receipts in 1960 amounted to \$4.4 billion, exceeding 1959 receipts by \$300 million and those of 1958 by \$900 million. Employer contributions totaled \$2.8 billion, or 64 percent of all receipts, and employee contributions were about \$400 million, or 9 percent of the total. Investment income from interest, dividends, rents, and other income rose to \$1.1 billion and accounted for 25 percent of total receipts. Total disbursements were a little over \$1 billion, consisting of \$990 million in benefit payments and \$30 million in administrative expenses.

Salesman's Wife Sells the Salesman

I LIKED THE WAY Stephen W. Stearns described the influence that a salesman's wife has on his performance. Mr. Stearns said, "There was a time when the busy executive didn't know whether his salesmen were married or not, and cared less. This isn't the case today among sales conscious managers.

"Statistics like those re-

the editor's notebook

(Continued)

cently garnered by the Atlanta Sales Executives Club explain why. Among the salesmen polled in this inquiry to determine the part played by the salesman's better half, 90 percent agreed that wives have a decided influence on their husbands' selling careers. A wife has (or 82 percent of the salesmen are convinced she has), for example, a great deal to do with his quitting his job. She has a great deal to do with his willingness to put in extra hours, to travel, to study.

"Quite simply, a wife can give her husband a reason to sell, or a reason *not* to sell, and it is only common sense to take whatever steps are necessary to aid her in the first-mentioned category. Her encouragement can inspire him to more real effort than a carload of pep talks and meetings."

Tired? Why Not Try A Midwinter Vacation?

HAVE YOU been feeling tired and out of sorts lately? Could be the result of the heavy fall schedule just finished. I recently read some excellent advice that may be just as good as a tonic for you.

Management Methods magazine had these worthwhile ideas:

Take a winter vacation — For the hard-driving executive this is not a luxury, but a necessity. Tension tends to accumulate. Breaking this tension with brief vacations in midwinter as well as midsummer is more effective than taking a long summer vacation.

Don't worry about exercise — Frantic workouts on the golf course or in the gym are worse for the middle aged executive than no exercise at all. You get enough exercise

You Can Feel The
Superior Quality!

ECONO-KAP — A smoke-pipe vent cap, die-formed from the best heavy gauge material. All-riveted to insure true size and highest quality. Research shows durability to be three times that of the average cap.

The multiple venturi-ports, built-in storm collar and correctly designed crown are precision-engineered to create exhaust suction and prevent down-draft.

Rain-proof, mushroom-design meets all Civil Defense specifications. Made of heavy gauge, pre-galvanized steel. Fits any family underground fall-out shelter air-intake and exhaust stacks.

Sensitively balanced to react to any air movement. Corrects lack of natural draft... eliminates down-draft as well as inspiring stack draft.

Star Kap

Shelter Hood

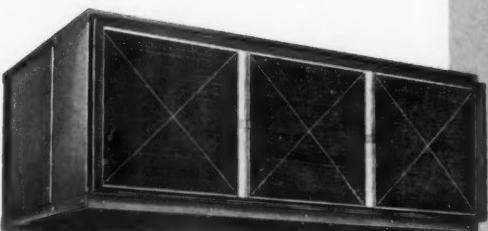
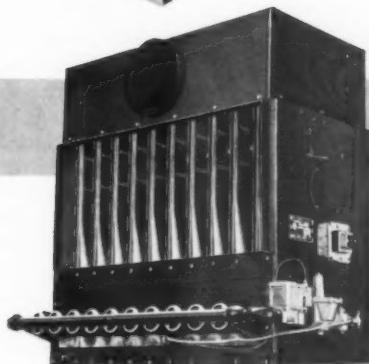
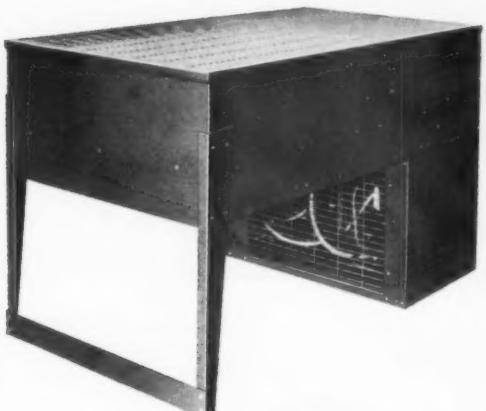
Venturi Top

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ST. LOUIS, MO.

FROM 65 YEARS OF ACHIEVEMENT...

MONCRIEF LIGHT COMMERCIAL AND INDUSTRIAL UNITS FOR 1962



8, 9 or 10 Ton Air Handling Blower-Coil Unit: A truly versatile performer. With one 4 or 5 Ton Condensing Unit . . . 93,000 or 114,000 Btuh. With two 4 Ton or two 5 Ton Units . . . 93,000 or 114,000 Btuh. With one 5 Ton and one 4 Ton Units . . . 103,000 Btuh. Simplified design and rugged construction. Twin Blowers for ample air deliveries against high static pressures. Filter Rack with High Velocity Filters and Weld Nuts for hanging are standard. Available now, A.R.I. Certified.

8 and 10 Ton Air Cooled Condensing Units: Exceptionally compact for roof-top or ground-level location. Shipped in 2 sections for easy installation . . . Compressor and Condenser each have holding charge and mating connectors. Twin Condenser Fans blow through for low velocity top discharge. "Mild Weather" Fan Control is standard. 16-gauge Zinc Coated Cabinet and Plastic Coated Grilles for unsheltered outdoor installation. A.R.I. Certified 8 Ton Unit available now . . . 10 Ton Unit in March, 1962.

Complete Line of Gas Duct Heaters: 100,000, 150,000, 200,000 and 250,000 Btuh . . . A.G.A. Approved for installation downstream of Evaporator with Aluminized Steel Heat Exchanger and Condensate Drain standard. Gas Controls on right or left side . . . Flue Outlet on one end and Manifold on other, or both on same end. Ideal companions to new Moncrief Air Handling Units. Available January, 1962.

CALL YOUR MONCRIEF WHOLESALER... NOW!

MONCRIEF

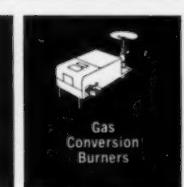
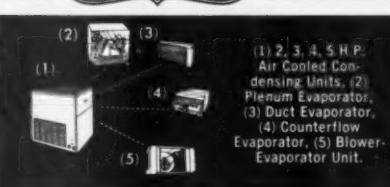
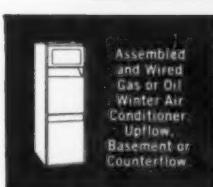
THE HENRY FURNACE

HEATING AND AIR CONDITIONING UNITS

MONCRIEF
SINCE 1895

COMPANY • MEDINA, OHIO

FURNACE PIPE AND FITTINGS



the editor's notebook

(Continued)

in your daily activity to keep you fit.

Make an effort to keep your weight down — Carrying excess poundage is sheer suicide. It's this simple: If you are 50 percent overweight, there's a 50 percent greater chance that you'll be dead a year from now. The cure is also simple: fewer calories.

Stop worrying about what other people think of you — Take the time to develop your own outlook on life, cultivate a sense of humor, and strive for an objective assessment of your own importance, and you will have taken three giant steps in defeating tension and anxiety.

Complaints Magnified With Every Telling

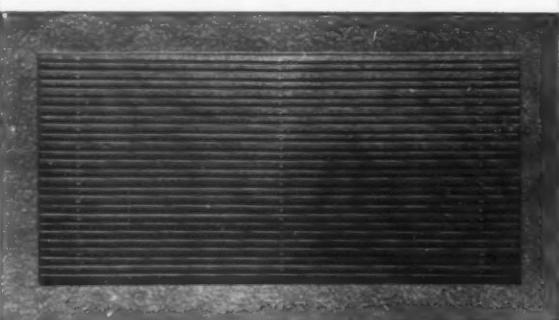
JUST ABOUT the most frequent subject of complaint to Better Business Bureaus is home improvement, according to the Northamerican Heating & Airconditioning Wholesalers Association. Chief causes of dissatisfaction are: guarantee or contract not fulfilled, promised adjustment not fulfilled, unsatisfactory installation or service. This is worth thinking about, NHAW points out, because an unhappy customer repeats his complaint often, and frequently the story gets exaggerated each time it is told.

Watch for Pitfalls In Retirement Plans

ADVANTAGES of a deferred compensation plan for dealer-contractors' key employees have been covered in this column during the past eight months. Last month's subject dealt with how to get such a plan started. This month, the following suggestions for avoiding common pitfalls of such plans are offered:

- 1) Set up your plan in

A-J Thin Core Grilles for Doors — Partitions 1/4" to 3/4" Thick!



- MINIMUM INSTALLATION TIME
- COMPLETE • NO WOOD MOLDINGS TO ADD!

Grille designed specifically for thin doors and partitions. Can be installed in just a few minutes time. Almost a half-inch extra on sides for positioning. Telescoping auxiliary frame fastens to grille with posts and screws. Clamps tight. All steel. Rattleproof. No vision, with 80% free area. Available with or without frame, wide range of sizes. Gray prime coated, or Hammertone finish in gray or bronze.

Write For Our Complete
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A-J MANUFACTURING CO.

Dept. A-12

3601 E. 18th St.

Kansas City 27, Mo.

the editor's notebook

(Continued)

such a way that you won't be "stuck" with a key man whom you might have to fire, or whose employment you may wish to terminate for one reason or another; be sure the agreement does not contain an actual or implied guarantee of a certain salary, or even continuing employment up to retirement age.

2) Be sure the plan is clear as to what "vesting," if any, a person has upon severance of his employment.

3) Be sure that the plan is set up in such a way that the premium (if insurance is used), or the annual "funding" (if some formal method of funding the plan is used), will not be taxable as current income to the key man.

4) Be sure your plan is set up so that the entire value of future payments won't be taxable as income to the key man in the year during which he retires.

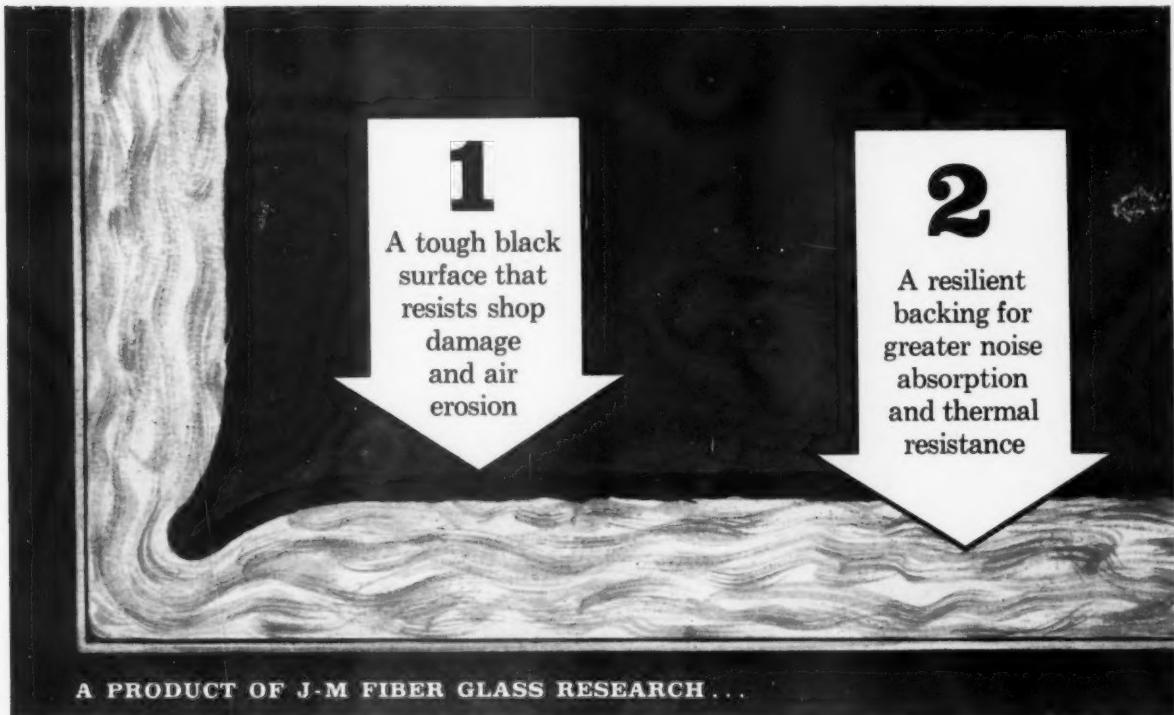
5) If you use life insurance, be sure that the life insurance policy is merely "key man" insurance, and is not tied into the plan as a funding device.

It is, of course, impossible to cover every facet of a technical program of this kind. It takes planning and careful thought. So take seriously the admonition to have the final specifications of your plan approved by legal, tax and financial authorities who are familiar with deferred compensation.

These suggestions have been published by the Small Business Administration in its Management Aid 107. Additional information is available and will be reported in this column next month.

Clyde M. Barnes

Editor



A PRODUCT OF J-M FIBER GLASS RESEARCH...

This "Dual Density" duct liner prevents shop damage and waste

New MICRO-BAR duct liner is resilient and easy to work with... yet so tough it defies tearing or scuffing.

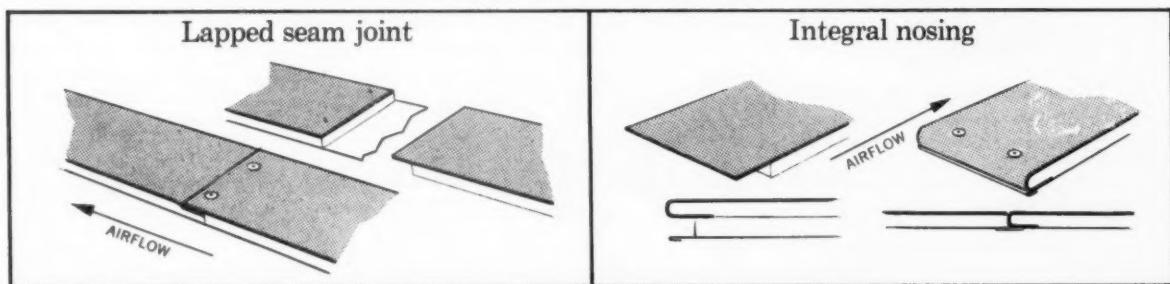
Only J-M MICRO-BAR offers you *two* densities. This unique construction allows MICRO-BAR to be flexible, and yet so rugged that you can easily fabricate it by customary methods. Another advantage... the heavy-density, erosion-resistant surface gives you a premium quality job at commercial quality cost.

You save time by forming MICRO-BAR right in the brake with the sheet metal. No danger of damage...

no tearing, no scuffing... no patching, no waste. MICRO-BAR has exceptional holding power for pins. And it is so kind to hands that no gloves are needed. This new Johns-Manville duct liner also has greater noise absorption and thermal resistance. It has earned the *lowest* Underwriters' flame-spread rating for flexible, coated fiber glass duct liners.

For complete information on this money-saving new J-M duct liner, call your J-M representative. Or write to J. B. Jobe, Vice-President, Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario.

MAKE THESE EROSION-RESISTANT JOINTS AND ELIMINATE COST OF EXPENSIVE METAL NOSINGS



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The Finest in Forced Humidification

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2

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FURNACE PIPE



Click . . . and seams are locked!

Easiest-locking seam on the market. Clicks together with little more than finger-touch pressure. You assemble all the joints you need for the job with minimum time and effort.

Joints are quickly, securely connected!

Short fade-away crimp quickly guides male end of joint into connecting joint. Entire distance from end of crimp to bead provides wide bearing surface — forms snug-fitting, secure connection without sheet metal screws.

Milcor Lock-Joint Furnace Pipe is available in 24", 30", 60", and 120" lengths. Popular sizes and gauges in Ti-Co galvanized steel. Ask your jobber or write to us for further information and prices.

MILCOR® Member of the  Steel Family

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BALTIMORE, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, DETROIT, KANSAS CITY,
LOS ANGELES, MILWAUKEE, NEW ORLEANS, NEW YORK, ST. LOUIS



Complete selection of matching fittings

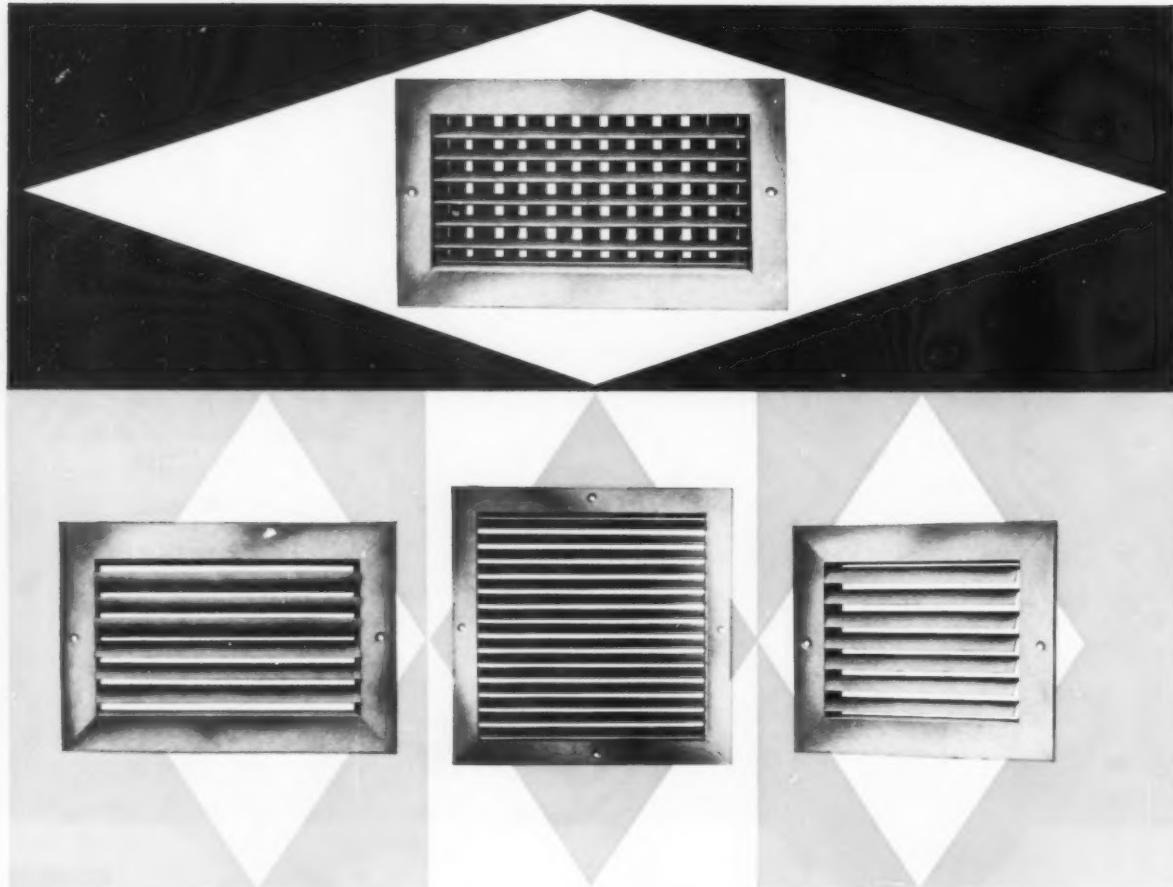
Compute your profits more accurately by eliminating the hidden costs of handmade fittings. Free your men for installation work so you can handle more jobs during the busy season. There's a complete selection of top quality Milcor standardized fittings available to meet every installation requirement. Use them to insure compact, neat-looking, owner-pleasing jobs.

*You can stake
your reputation on
a Milcor installation!*



STANDARDLINE

extruded aluminum grilles and registers
withstand even salt air environment



YOU CAN COUNT ON STANDARDLINE

grilles and registers to retain their "just-installed" appearance even in the most destructive environments. All parts are of extruded aluminum . . . far stronger than rolled aluminum . . . and are impervious to rusting, pitting, corrosion . . . even in salt air.

Surfaces are etched to a rich lustre and coated with a clear acrylic lacquer. The fine finish serves as a perfect base for color-matching grilles and registers to an existing decor, without fear of "bleed-through" or need for a prime coating.

There is a T&B STANDARDLINE grille or register designed to fill the bill for your jobs. For more information, call your nearest T&B Representative or write us direct.



TUTTLE & BAILEY

Division of Allied Thermal Corporation
New Britain, Connecticut
Tuttle & Bailey Pacific, Inc., City of Industry, Calif.

WHAT'S HAPPENING...

Researchers to Begin Mild Climate Studies

CLEVELAND — A new research home at San Jose, Calif., marks the extension of the National Warm Air Heating and Air Conditioning Association's research program to the West Coast. Installation of test equipment is now under way.

Studies at the San Jose research home will be carried out by members of the faculty of San Jose State College to determine air conditioning characteristics of a crawl space home in a mild climate area. S. Brooks Walton, head of the mechanical engineering department, will head the faculty group responsible for instrumentation, testing and preparation of reports on the various research projects.

Tests will utilize insulated and uninsulated ducts in crawl spaces. Floor-to-ceiling, wall-to-wall and room-to-room gradients will be checked along with air velocities, distribution and draft conditions. All tests will cover both heating and cooling, except that no cooling tests will be made with uninsulated ducts in a vented crawl space.

Members of the NWAHACA West Coast research advisory committee who directed arrange-

ments for the research project are George Aronovsky, Tuck-Aire Furnace Co.; Al Baak, Cam-Stat, Inc.; Robert Boyer, Minneapolis-Honeywell Regulator Co.; Charles S. Conrad, Warm Air Heating Institute of Northern California; Russell David, Federal Housing Administration; Art Horn, Day & Night Mfg. Co.; and Jack Wolff, General Controls Co.

January Issue Will Feature Show Section

CHICAGO — A special show section is being prepared for the January issue of American Artisan. It will outline the activities planned for the 12th National Exposition of the Air-Conditioning, Heating and Refrigeration Industry scheduled for the Great Western Exhibit Center, Los Angeles, Feb. 12-15, 1962.

Artisan's special show section will list exhibitors and booth numbers. This special section is designed to tell you how to get the most out of the time spent at the show.

According to George E. Mills, director of the show, more than 210 exhibits will be on display.

The exposition is under the sponsorship of Air-Conditioning and Refrigeration Institute. A technical program has been scheduled to be held during the exposition. The technical sessions will be at the Biltmore Hotel; subjects of the papers will be covered in the show section along with names of the speakers and presentation time.

What's Reserve Status Of Your Key Workers?

CHICAGO — The importance of checking on the reserve status of key employees was recently pointed out by the Illinois Manufacturers' Association. Those reservists who belong to the Ready Reserve will probably be called first, the association notes. However, if they are engaged in critical civilian occupations, it is possible that they may be reclassified as Standby Reservists. Requests for reclassification should be addressed to Major James H. Voyles, Chief, Manpower Div., Illinois Selective Service System, 405 E. Washington St., Springfield, Ill.

Among the job categories included in the list of critical civilian occupations are sheet metal workers, pipe fitters, industrial maintenance mechanics and engineering design draftsmen.

Winegardner To Head NWAHACA

CHICAGO — Don Winegardner, The Majestic Co., was elected president of the National Warm Air Heating and Air Conditioning Association during the group's 48th annual convention held recently at Chicago's LaSalle Hotel. Other new officers are: first vice president, Harold P. Mueller Jr., Mueller Climatrol, Div. of Worthington Corp.; and second vice president, Ronald N. Campbell, The C. A. Olsen Mfg. Co. James M. Martin remains managing director and secretary-treasurer.

New trustees elected for two-
(Continued on page 19)

1961 Volume Index

To Be Available

CHICAGO — An index for American Artisan's 1961 issues, Vol. 98, Nos. 1-12, is being compiled and will be available soon to Artisan subscribers on request. If you want a free copy, send a note to the Editor, American Artisan, 6 N. Michigan Ave., Chicago 2.



For strength and ductility you can't beat

BETHCON GALVANIZED STEEL SHEETS

Bethcon galvanized sheets have a remarkable combination of strength and ductility that assures smooth shopwork and satisfied customers.

Bethcon sheets owe their superior qualities to Bethlehem's continuous annealing process which gives the base steel its strong-yet-workable characteristics.

Bethlehem's continuous galvanizing process bonds the zinc coating so tightly to the steel that

you can put a Bethcon sheet through the toughest forming processes without cracking or flaking the coating.

Bethcon is available in a wide variety of gages, in coils or cut lengths, with either plain open-hearth or copper-bearing (Beth-Cu-Loy) steel for the base metal. If you want further information on Bethcon, your inquiry will get prompt attention from the nearest Bethlehem office.



for Strength
... Economy
... Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



WHAT'S HAPPENING...

Continued from page 17

January Artisan To Contain Directory Section

CHICAGO — American Artisan's Directory Section of Warm Air Heating, Air Conditioning, Sheet Metal, Ventilation and Dust Removal Products — revised and brought up to date — will appear in the January issue.

To obtain information on what products will be available during 1962, listing sheets were mailed to thousands of firms throughout the country that manufacture the hundreds of items used in warm air heating, air conditioning, ventilation, dust removal and sheet metal work. The information is carefully classified and includes complete street addresses and trade names of the manufacturers listed.

The January issue also contains its regular quota of timely and informative articles on technical, merchandising, management and news subjects.

Lockhart Elected AMCA President

DETROIT — Charles W. Lockhart was elected president of the Air Moving & Conditioning Association, Inc., during the group's seventh annual meeting held recently at Greenbrier, W. Va. Mr. Lockhart has served several terms on the board of directors. He has also served as chairman of both the Centrifugal Fan Div. and the AMCA Steering Committee. He is vice president in charge of sales for Buffalo Forge Co.

Other officers named for

(Continued on page 22)

Russell Gray Named New ARI President

HOT SPRINGS, VA. — Russell Gray, president of Carrier Air Conditioning Co., was elected president of the Air-Conditioning and Refrigeration Institute at the group's recent annual meeting. Mr. Gray has been a vice president of ARI for the past two years.

Other newly elected officers include four vice presidents: Joseph B. Elliott, president, York Div., Borg-Warner Corp.; Thomas Hancock, executive vice president, The Trane Co.; B. E. James, president, McQuay, Inc.; and John W. Norris, president, Lennox Industries Inc. Two vice presidents were re-elected. They are: L. N. Hunter, director of engineering of the Plumbing,

Heating and Air Conditioning Group, Crane Co., and F. J. Kreissl, president, American-Standard Controls Div. (Under a recent change in its bylaws, the institute now has six instead of three vice presidents).

W. H. Aubrey, president, Frick Co., was re-elected treasurer of ARI.

New members of the board of directors are: George R. Allen, vice president, Superior Valve & Fittings Co., representing the Valves, Driers, Fittings and Accessories Section of ARI; George T. Costello, president, National Heater Co., Inc., representing the Non-Residential Warm Air Heater Section; James H. Manecke, vice president, Ranco, Inc., representing the Temperature Controls Section; H. Blake Thomas, Carrier Corp., representing the Refrigeration Heat Transfer Products Section; and L. L. Willis, chief engineer, Thermo King Corp., representing the Mobile Refrigeration Section. New directors at large are William P. Balthrop, president, Airtemp Div., Chrysler Corp., and H. T. Jarvis, president, Recold Corp.

NWAHACA Elects New Officers

(Continued from page 17)

year terms are: J. P. Field, The Williamson Co.; Jack Ray, General Controls Co.; Ted Fowler, Owens-Corning Fiberglas Corp.; Thompson Morrison, Morrison Products, Inc.; and R. W. Geisler, Skuttle Mfg. Co.

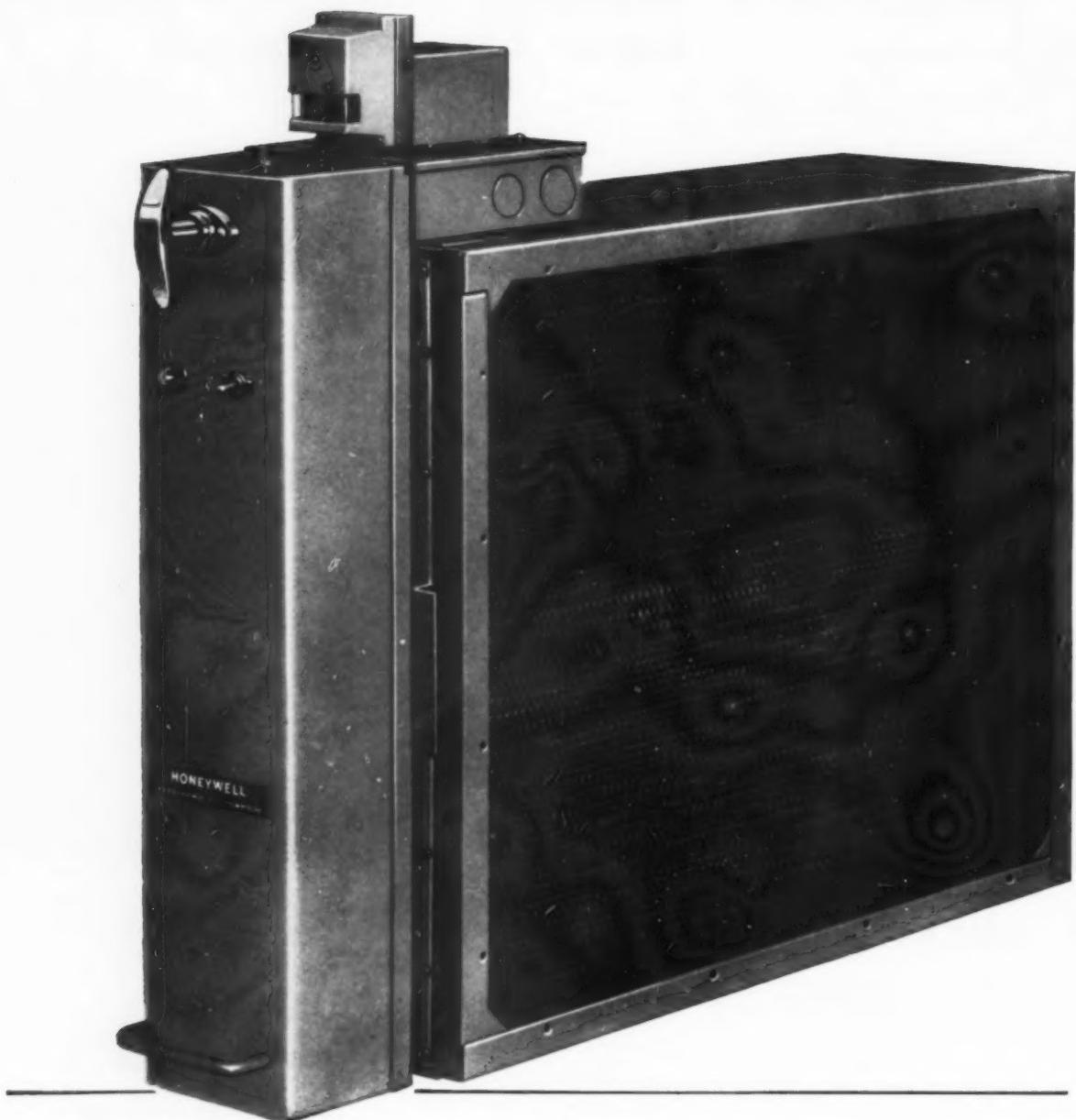
Continuing as members of the board of trustees are: Roy C. Brainard, Standard Metal Fabricating Co. of Texas; Keith T. Davis, Bryant Mfg. Co.; Robert L. Leigh, Air Control Products, Inc.; Jess L. Moore Jr., The Coleman Co., Inc.; Harold W. Mutz, Peerless Corp.; Clyde H. Wilkinson, Air Conditioning Div. of American-Standard; and Kent L. Wilson, Minneapolis-Honeywell Regulator Co. Harry C. Gurney, former NWAHACA president, is now ex-officio.

NHAW Completes Basic Correspondence Course in Heating

COLUMBUS — The educational committee of the Northamerican Heating & Airconditioning Wholesalers Association recently completed work on a basic correspondence course in heating. The

(Continued on page 22)

The first ELECTRONIC



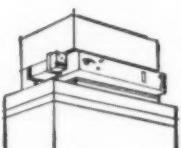
Living Area Control Center provides a constant performance check. Indicates when collectors need washing. Permits remote operation of fan.



Filter Flag* indicates at furnace or air conditioner and at the Living Area Control Center when the protective screen needs cleaning.



Simple Washing Kit includes everything the homeowner needs to wash the air cleaner collectors (normally once every three months).



One-Side Access feature makes it possible to install the unit in any location. Clearance is required only for removal of the door assembly.

AIR CLEANER

designed exclusively for the home!



Here's the profit package that introduces an entirely new concept in elegant living—the Self Cleaning Home! With this exclusive new air cleaner you sell many ideas . . . less housework, fewer cleaning and decorating bills and effective removal of airborne allergy irritants. And, you offer builders a dramatic new sales feature . . . guaranteed to stimulate interest in their homes. Either way, the Honeywell Air Cleaner can help you beat the cost-price squeeze—and it's good for your add-on business, too!

The complete unit comes to you as a package and can be installed simply. You keep full profits because the homeowner performs the simple maintenance himself. The initial low cost of the Honeywell Air Cleaner is also an important selling point. And because it requires no plumbing and fits easily into any forced air system, it can be installed for up to \$100 less than other units.

Available in two sizes (20 x 25 and 16 x 25 in.), the Honeywell Air Cleaner is only 7 inches thick when installed in the return air duct. Handles up to 2200 CFM (about 5½ tons of cooling—220,000 BTU output, heating).

Tests by the National Bureau of Standards' Dust-Spot Methods prove that the Honeywell Electronic Air Cleaner traps from 70 to 95% of all airborne particles, depending on rate of air flow. By comparison, standard mechanical filters have an efficiency range of from 5 to 8%; and charged media filters average less than 50% efficiency.

For complete details on Residential Electronic Air Cleaning and for a free merchandising kit, call your nearby Honeywell office. There are 112 throughout the country. Or, write Honeywell, Dept. AA-11-142, Minneapolis 8, Minnesota. In Canada, write Honeywell Controls, Ltd., Toronto 17, Ontario. *Sales and Service offices in all principal cities of the world.*

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Honeywell

First in Control



SINCE 1886

HONEYWELL INTERNATIONAL
Sales and service offices in all principal cities of the world. Manufacturing in the United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.



**Here's why
we're up to our ears
in screws!**

Southern Screws

Regardless of the size, head style, material or finish of the standard fasteners needed for profitable assembly in your plant, Southern carries them in stock. This means that your order, large or small, can be on its way to you within hours after it is received, if you request rush service.

You are the reason we are up to our ears in fasteners! We're ready—today—to fill your order with USA-made Southern fasteners. Write direct to Southern Screw Co., P. O. Box 1360, Statesville, North Carolina for our current Stock List, or see your local Southern distributor.

Manufacturing and Main Stock
in Statesville, North Carolina

Warehouses:

New York • Chicago • Dallas • Los Angeles

1. 25. 25. F. & RF Thread Cutting Screws •
A. F. C. & BR Tapping Screws • Stove Bolts •
Drive Screws • Machine Screws & Nuts • Carriage
Bolts • Continuous Threaded Studs • Wood Screws
• Hanger Bolts



WHAT'S HAPPENING . . .

(Continued from page 19)

ASHRAE Works on Program For Semi-annual Meeting

NEW YORK CITY — Four technical sessions on heating and heat transfer, air filters and refrigeration will feature the semi-annual meeting of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, scheduled to be held Jan. 29-Feb. 1 at St. Louis.

Papers to be presented include "The Operating Economy of Air-Cooled Refrigerant Condensing," "Cross-Flow Cooling Tower Analysis and Design," "Operating Principles of Non-Ionizing Electrostatic Air Filters," "Solar Heat Gains Through Plain, Coated and Laminated Flat Window Glass," "Energy Sources and Requirements for Residential Heating," and "An Instrument for the Measurement of the Humidity of Air."

Of interest to the heating and air conditioning industry are two symposiums scheduled, one covering industrial ventilation, the other, combined heating and air cooling systems.

ASHRAE reports that it recently concluded an agreement with the University of Florida under the terms of which the university will continue the study of air conditioning loads due to

Elect AMCA Officers At Greenbrier Meeting

(Continued from page 19)

1962 are: vice president, L. A. Macrow, chief engineer, Carrier Air Conditioning Co.; vice president, R. C. Niess, manager of product sales, York Div., Borg-Warner Corp.; secretary-treasurer, John F. Tobin, vice president of marketing, American-Standard Industrial Div.

solar radiation that the society has been conducting in recent years. The society's solar calorimeter with instrumentation and all scientific equipment will be transferred from the ASHRAE Cleveland laboratory to the University of Florida in Gainesville. The calorimeter will be housed in a 12 x 12 ft structure at the university's engineering and industrial experiment station. The co-sponsored project will be identified as the "ASHRAE-University of Florida Solar Calorimeter."

The university plans to use its new facility for co-sponsored projects concerning solar utilization, such as the study of solar heat gain through glass and other structural components and the influence of shading devices on heat gain.

NHAW Heating Course Now Being Printed

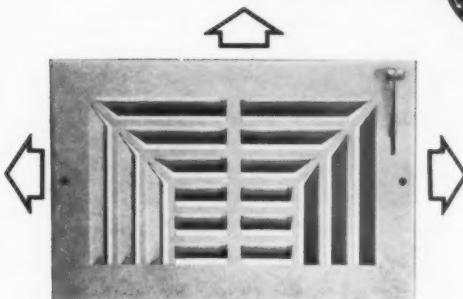
(Continued from page 19)

course, now being printed, will be available through members and associate members of NHAW.

Serving on the committee responsible for the preparation of the course were W. R. Bull, NHAW executive director; John Williams, technical adviser; R. J. Woodward, NHAW educational committee coordinator and an officer of the Palmer-Donavin Mfg. Co.; Dr. William B. Logan, director of Distributive Education, Ohio State University; Bud Hearne, Buckeye Mfg. Co.; Fred Gurley, Vorys Bros., Inc.; Harold Squire and Ned Wagstaff, Squire Heating Supply Co.; and Herb Hays, Armstrong Furnace Co.

NEW

from  STANDARD



3-WAY AIR DIFFUSER

designed
to keep quality high . . .
costs low.

can be used in CEILINGS . . . SIDEWALLS . . . BASEBOARDS

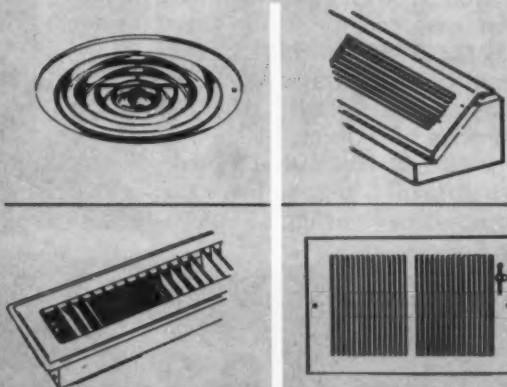
One piece damper control gives instant control of air flow. Eliminates "hot spots," airless areas, drafts. Provides an evenly distributed flow of air.

- * Ideal for heating and cooling
- * One piece face
- * Heavy, rigid, all steel construction
- * Sponge rubber gaskets
- * Standard mounting holes
- * Attractive ornamental grey baked finish.

It's Well Known News... Standard Makes The Finest

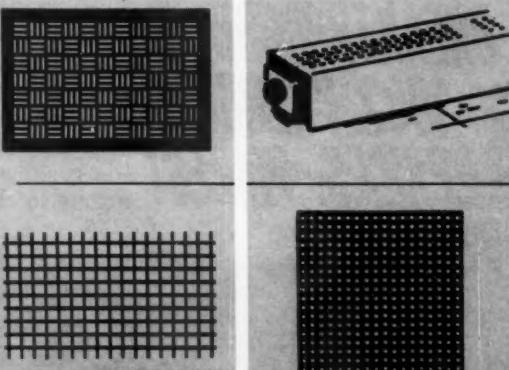
REGISTERS and GRILLES . . .

air diffusers, intakes and returns for heating, air conditioning and ventilating.



PERFORATED METALS . . .

for "custom-covered" enclosures and convectors, air intakes and outlets. All sizes, shapes and patterns.



Standard—renowned for consistent quality, all-around dependability, satisfying economy. Standard products are profitable to sell—time saving to install. Inquire.



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MAIL THIS COUPON TODAY!



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Gentlemen: I'd like more news about your

- NEW 3-WAY DIFFUSERS
 Complete Line of Registers and Grilles
 PERFORATED METALS

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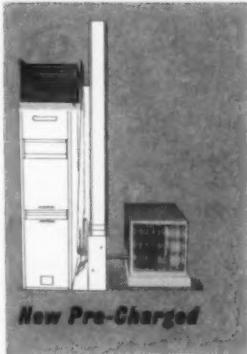
COMPANY _____

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CITY, ZONE, STATE _____

AMERICAN-STANDARD MAKES THE BIG BREAKTHROUGH IN 1962 PRODUCTS, PRICES, PRIZES!

1962 competition for heating and cooling sales will be rough—but American-Standard will put its dealers right at the top! Take products. The new APT and ACPC **PRE-CHARGED ECONOMY SPLIT SYSTEMS** can save you \$100 on equipment cost, \$100 on installation cost! A complete new line of low-cost, top-quality **ELECTRIC FURNACES** can be installed in any position. The new thru-wall **VENT-ED HEATERS** are tops, and the new **UNIT HEATERS** offer a sensational price breakthrough! The new American-Standard **POWER HUMIDIFIER** really works . . . spins moisture off a disc, so there's no nozzle to clog and no money-wasting call-backs.





Economy Split Systems!



You win a "HEYDAY HOLIDAY!" When you sell the new 1962 American-Standard cooling line, at the new competitive prices, you can win a free vacation week-for-two in an exotic foreign land with a rich, historical past; enjoy luxurious hotel accommodations with superb food; gay night life; visits to famous landmarks. Relax at one of the world's greatest seaside resorts for sunning, swimming, golf and deep-sea fishing. It's all free—plane fare, hotels, food, entertainment—everything! Our liberal pre-season finance plan helps you earn the contest points you need fast! Want more information about this great *free* vacation? Contact your American-Standard Air Conditioning Division Distributor right now!



AMERICAN-STANDARD
AIR CONDITIONING DIVISION

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PUTTING THE HEAT ON

... winter

snow problems

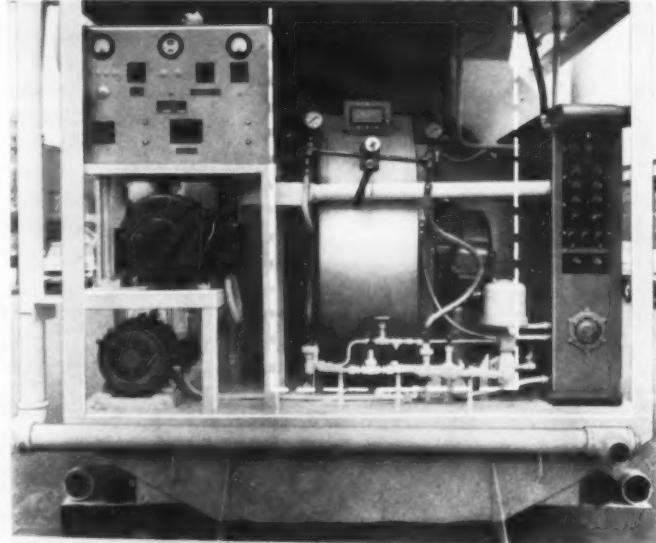
with the help of CLARAGE

FAN

Down the drain . . . Tons of snow in minutes! That's the performance of this unique truck-mounted machine, developed by Peabody Engineering Corp., New York City, to hasten snow removal and eliminate hauling problems.

A built-in furnace, using light oil as fuel, gives a "hot foot" to the snow poured in by a conventional snowloader. The melted snow is discharged onto the street in non-freezing weather or by hose directly into sewers in freezing weather.

Speeding the melting process is a No. 117 Type XL Clarage Fan with a pancake motor. This space-saving fan arrangement suggests how Clarage "comes through" — meeting difficult design limitations — with ideal equipment for original equipment manufacturers. No matter how challenging your application requirements, investigate the plus values of incorporating dependable Clarage Fans.



Dependable equipment for making air your servant

CLARAGE FAN COMPANY

Kalamazoo, Michigan

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

How to Increase Your Sales

NOW IS A GOOD TIME to review seriously what has taken place since January 1, 1961. You will of course examine sales volumes for each month and consider ways that will help improve them in '62. You'll check your purchasing habits and realign them to match closely your inventory requirements. You'll also examine employees' performance and plan steps to prevent expensive waste in their time, both in the shop and on the job.

Annual review and future planning are necessary functions of the good business manager, but there is another step that can be taken that will pay handsome dividends in increased sales during the coming year. It is a practice described to us by a number of successful dealer-contractors around the country. They conduct a thorough review of the reasons why prospects made their purchases elsewhere — or why they didn't buy at all.

Our suggestions — as presented here — are a composite of the practices and views given us by dealer-contractors who are consistently among the largest volume producers in their respective areas. Their suggestion is to start an investigation of why people failed to buy from your company by examining every record you have on prospects called upon since the year began.

Make a list of the reasons you can think of that caused you to lose the sale. Don't attempt to classify the prospect at this time — just form a list of reasons for the failure. Next, make a list of reasons why people did buy from your company. You must be realistic in compiling this list. Don't attempt to flatter the company's success by classifying sales in too general terms.

Now examine each sale. Did you make the amount of money you expected, or was it an unprofitable sale? What are the reasons?

Next step — make another list. Compare the reasons for unprofitable sales with the list of reasons people failed to buy. Are these reasons related?

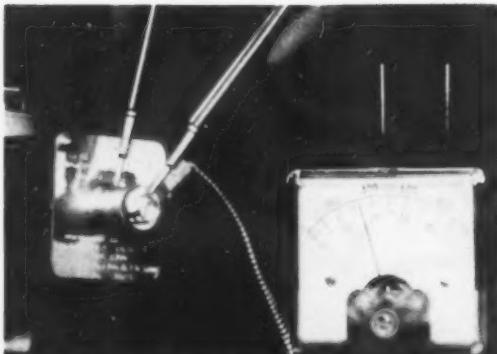
Armed with these initial observations, dealer-contractors tell us, they are able to do two things that can help sales during the next season. One, they use the reasons for people not buying to rebuild their sales approach. And, two, they prepare a form to aid them in analyzing each sales call made.

Analyzed calls have several features: They show progress in developing better sales presentations, act as guides for new members of the sales staff, provide leads to new prospects, and add to the list of things to check each year to head off prospect objections.

Often, we are told, prospect objections are taken for granted and accepted at face value. But periodic review of reasons why a presentation missed helps to chart the way toward overcoming these circumstances.



American Artisan's editors, staff and authors wish you all a Merry Christmas and a Happy New Year



SERVICE CLINIC

By Tom Tatone
General Controls Co.

PROPERLY EQUIPPED servicemen will carry with them the instruments they need to quickly diagnose safety control difficulties and accurately determine the source of trouble. Too often the trial and error method of solving a service complaint results in the replacement of controls that are in good working order. This practice creates wasteful loss of time and money to service organizations and often causes dissatisfied homeowners.

All servicemen are urged to include among their tools, a:

- 1) Millivolt meter and protective case.
- 2) Single thermocouple test adapter.
- 3) Three inch jumper wire with clips.
- 4) Complete set of manuals on the use of each instrument.

Pilot safety controls are classified in two general categories: 1) gas line shutoff valves, and 2) electric relays which interrupt primary gas valve current. Both controls are operated from millivoltage power sources.

The three basic types of power sources, are:

- 1) Single thermocouple.
- 2) Combination pilot generator (which includes two or more pilot burner heads and a multiple thermocouple).
- 3) Single pilot generator. (A multiple thermocouple and a single pilot generator produces less power than a combination pilot generator.)

Positive identification of the type of power source must be made before the correct test procedure can be followed. Service literature, when used with test procedures, reduces the time required to accurately diagnose a malfunction.

Check Flame First

A single thermocouple circuit should be checked as follows:

- 1) Make certain there is a healthy flame and that proper impingement on the tip of the thermocouple is occurring. (A non-blowing blue flame bathing the top $\frac{1}{4}$ in. of the thermo-

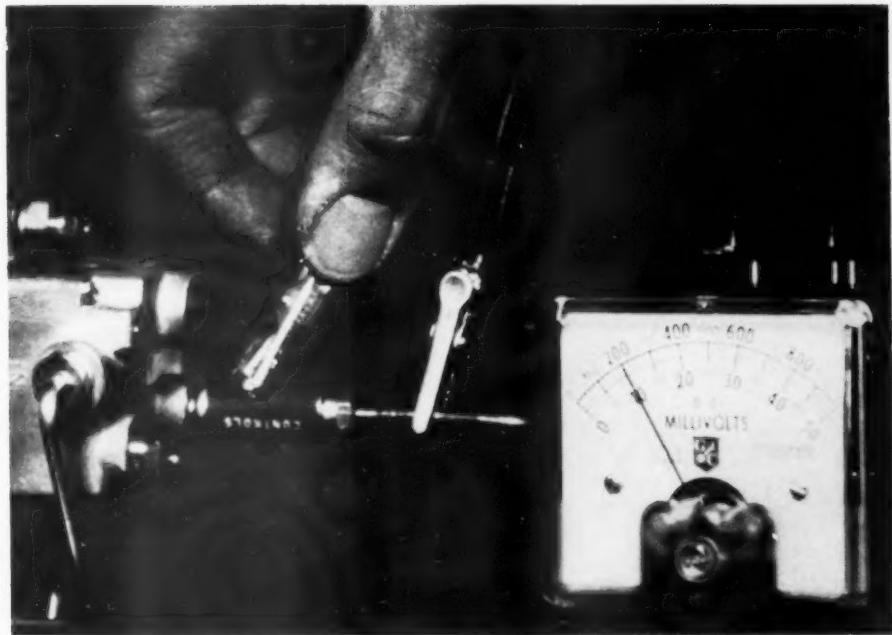
couple is desirable.) Cleaning of pilot openings will usually improve conditions.

2) Disconnect the thermocouple from its safety valve or relay, and insert the thermocouple test adapter fitting. Reconnect the thermocouple connections and place one millivoltmeter test lead on the adapter tubing. Place the other test lead on either stud projection of the adapter fitting. This test enables the serviceman to obtain a closed circuit reading of the safety system circuit.

When the control does not require the described fitting because the thermocouple is fastened to terminal screws, apply test leads to the exposed terminals. The closed circuit reading must be 7 or more millivolts. If the reading is less than 7 mv, the pilot flame must be readjusted or the thermocouple replaced. If a reading of more than 7 mv is recorded, but the safety device does not "hold in," change the thermomagnetic head assembly or replace the entire safety unit.

How to Service

Pilot Safety Devices



POWER OUTPUT of a thermocouple generator is determined by use of a millivoltmeter and thermocouple adapter

Relays and controls energized by a pilot generator must also be checked with a closed circuit. The procedure is as follows: With the pilot flame satisfactorily adjusted (a blue flame surrounding the pilot generator cartridge), apply the meter test leads across the terminal screws of the safety relay or valve. The meter reading must be 185 mv or more. If less, clean the orifice and primary air holes of the pilot burner.

Adjust for Clean Flame

If this test fails to improve the power output, it will become necessary to replace the generator cartridge. If the meter reading is above the recommended 185 mv and the relay or valve does not "hold in," it will be necessary to replace the relay or control being tested.

The single pilot generator has been widely used because it con-

stitutes a power source (250 mv) between a single thermocouple and a multicouple pilot generator, which is capable of a 700 mv open circuit reading.

In checking a single pilot generator circuit, place one test on the terminal stud and the other test lead on the relay or valve body adjacent to the terminal stud. This reading must be a minimum of 140 mv. If less, readjust the pilot flame or clean the pilot burner orifice and primary air holes.

If this test fails to produce satisfactory operation, replace the generator. If the reading is more than 140 mv and the unit does not "hold in," it is necessary to replace the relay or valve.

Many safety pilot relays are designed to "plug-in" to primary gas valves, using four prongs similar to some radio tubes. An additional check to those previously explained may be made by unplugging the relay and insert-

ing a jumper wire in the two horizontal holes of the valve. With the thermostat and limit control calling for heat and the power on, the valve should open promptly; if not, replace valve.

Follow These Suggestions

Service problems will be minimized if these suggestions are followed:

- 1) All millivolt meter readings should be made on a closed circuit. (A closed circuit reading means that the thermostat is calling for heat and all electrical connections are made.)

- 2) Make a positive identification of all components.

- 3) Use all service literature to aid in the identification of both old and new style controls.

This paper was presented by General Controls Co. at a membership meeting of the Institute of Heating and Air Conditioning Industries in Los Angeles.



REPAIR PARTS are cataloged and stored in separate bins that make inventory and reordering easy. Parts stock includes controls, valves, regulators, thermostats, transformers, oil filters, etc.

Here's How

Small City

A weekly check of frequently used service parts and installation equipment during the busy season prevents completion delays and cuts callbacks

"NOT HAVING a local source of supply from which urgently needed parts can be quickly obtained often creates an inventory problem for dealer-contractors located in small communities and rural areas. The question of what parts to keep on hand and how many of each, plus constant ordering, is a problem that dealer-contractors serving metropolitan areas can be thankful they do not have to face," says James W. Ridgway, Ridgway Heating and Air Conditioning, Inc., Frankfort, Ind.

Records Control Inventory

The study of inventory control and other business problems typical of dealer-contractors serving small cities has become a hobby with Mr. Ridgway.

Records kept since the company was formed in 1950 reveal a pattern that outlines the principles he uses, not only to maintain his inventory, but to take advantage of quantity discounts and locate new customers to help turn over his inventory at regular intervals.

Visual inventory checks are made once a week during the busy season, less often during other portions of the year when business is at its normal rate. The Ridgway company serves a community of approximately 16,000 and is the largest of eight heating and air conditioning companies located in the community. The staff consists of six mechanics, one office manager and the owner, James Ridgway, for a total of eight. The mechanics are divided into two full time sheet metal journeymen,

THROWAWAY and washable type air filter stocks require a weekly check during the busy season to adequately supply every size needed. This work is handled personally by dealer-contractor James W. Ridgway



Dealer Maintains Inventory

two full time servicemen, and two men that alternate between servicing and installation, based upon the volume of work on hand.

All employees became associated with the company without prior experience in this field and have received their training under Mr. Ridgway.

Weekly meetings are held in which the technical aspects of heating and air conditioning components, their application and recommended installation procedures, and the theory behind the functions of the various parts of the assemblies are discussed. The continuous training program not only includes technical information, but each employee is reminded of his important position in the company and how his ability to serve the customer well reflects upon his steady employment and the welfare of the company in general.

Employees are encouraged to report abnormal usage of inventory stock so that orders may be placed ahead of the normal schedule.

In spite of every effort to maintain a sizable stock of replacement parts, it is not unusual for some out-of-date part to have to be temporarily repaired until a replacement or substitute part can be obtained from the manufacturer or wholesaler.

A thorough knowledge of the operating theory behind equipment components helps the company's

servicemen to temporarily put equipment into service until repair can be made on a permanent basis.

To aid mechanics in the temporary maintenance of worn parts, a work bench has been set up and testing apparatus designed to duplicate on-the-job conditions.

When parts are repaired, it is seldom that such a part will be placed in stock. Only in cases where parts are no longer available from their original source of supply is this practice followed. In the case where a repaired part is taken from stock, its cost to the customer is based on the time and material used to put the part into good working condition.

Customers requiring repaired parts are informed that new parts are not available and that a repaired part is available and suitable to meet their needs. Under no circumstances is the customer given the impression that the part is other than a repaired part.

Whenever a defective part can be replaced by a new part or a factory overhauled part, the company policy is to use the replacement part. Mr. Ridgway stated that occasionally there is a customer who insists that the part be repaired rather than replaced, and if this is the case, the customer is charged for the amount of time and the material



TRAINING CLASSES for employees are held regularly to explain new equipment and the theory behind its operation

continued . . .

Regular Training Program and Up-to-date Price Book Align Costs With Estimates



MAINTENANCE OF the price book is the result of frequent conferences between James W. Ridgway, and his office manager, Gustau Langwag

needed to repair the part. However, every effort is made to convince the customer that replaced parts are more economical in the long run.

The company has an annual volume of approximately \$135,000. This includes commercial work for farmers, small industries and stores located in the area. The inventory amounts to about \$12,000 and is turned over approximately six times a year. Every effort is made to prevent an accumulation of obsolete parts. There is little hope of recovering money invested in slow moving or obsolete inventory.

Dealer-contractors serving small communities must maintain their reputation for reliability. One way to do this is by selecting employees who get along well with customers. Dealer-contractors must also provide the best in engineering service as this is the major plus feature they have to sell. All customers must be treated fairly and alike because customers frequently compare notes on subjects of common interests.

To help maintain service charges at a reasonable level, a price book is used at Ridgway Heating. This price book makes it possible that all services, parts and equipment provided by the company are charged for at the same rate.

TEST BENCH for repaired parts makes it convenient for Bill Stillwell, shop foreman, to check the operation of a pilot thermocouple



There are two master office copies of the price book. One copy is kept in a fireproof vault and a second in the business office for quotations and billing. Changes entered in the price book are based on new pricing sheets when received from suppliers.

Public recognition is essential in a small community to gain customer and prospect confidence. Mr. Ridgway stated that dealer-contractors like himself serving small areas profit most when they are active in civic affairs. He is on the board of directors of the country club, is a member of the Elks, the Rotary Club, American Legion, Veterans of Foreign Wars, Loyal Order of Moose, and the Chamber of Commerce. He attends church each Sunday. People he associates with at meetings of these groups are often the source of exclusive leads to new or modernization work being planned. Recently, his membership in the Elks paid off when he was awarded a contract to install a 10-ton air conditioning unit.

Employees Develop Tools

In addition to the duties as manager of his company, Mr. Ridgway spends time encouraging his employees to develop equipment that will help them in their work. The development of the repair bench is the outgrowth of an idea provided by shop foreman Bill Stillwell. He felt that a place was needed for cleaning and adjusting those parts that had to be repaired and used until replacements could be

obtained. Another idea developed by one of the employees is a double row of metal drawers located above the pattern and layout bench. These drawers are used for handy storage of sheet metal screws and rivets.

It's ideas such as this that make it possible for Ridgway Heating and Air Conditioning Co. to economically produce quality work at all times even though remotely located from large sources of supply.

Social Contacts Lead to Sales

PUBLIC RECOGNITION is essential in small communities. Participation in civic affairs is one way to gain this recognition. Membership in the Rotary Club, Loyal Order of Moose, Elks, Veterans of Foreign Wars, American Legion, Masons, Knights of Columbus, Chamber of Commerce, Country Club, and church groups, bring the dealer-contractor into social contact with most of the businessmen of the area with the result that when heating, air conditioning or sheet metal work is contemplated, the socially active dealer-contractor will be favorably considered.

Can You Solve These 12 Summer Air Conditioning Problems?

FOR CHECKING technical know-how, this article poses 12 typical air conditioning questions. Each reader should make an effort to answer these before looking at the answers appearing on the next three pages. It should be noted that every question not correctly answered can mean a monetary cost to a dealer-contractor and, most likely, a dissatisfied customer. Here are the 12 questions. What are your answers?

1. What cfm is needed?

Hypothesis — The calculated heat gain for a house from all sources (sensible and latent) is 40,000 Btuh. How much air must the cooling system circulate to handle this load?

2. Will blower handle cooling load?

Hypothesis — Cooling is to be added to an existing forced warm air heating system. What must be considered in respect to air requirements and blower adjustment?

3. What is temperature of air mixture?

Hypothesis — A certain job requires 20 percent outside air for ventilation. In order to select cooling equipment, it is necessary to know the condition of air entering the cooling coil. How is this determined?

4. One room doesn't cool. Why?

Hypothesis — A particular living room has both east and south exposures each with glass. The overall house cooling load calculated at 4 p.m. shows that this room requires 200 cfm. The duct and register were sized accordingly, but the room is too warm. Why?

5. Should storm windows be used in summer?

Hypothesis — A homeowner continues to replace his storm windows with screens every spring even though he added cooling to his warm air system almost two years ago. Is he right?

6. Which to use, 3-ton or 2-ton unit?

Hypothesis — A residential heat gain is estimated to be 30,000 Btuh. One dealer-contractor offered a 3-ton unit and lost the job to another dealer-contractor who promised that a 2-ton unit would do the job. How can he get away with this?

Continued on page 37



PRACTICAL SOLUTIONS TO AIR CONDITIONING PROBLEMS

By S. W. REID
Air Conditioning Engineer
Gilbert Associates, Inc.

Here Are Answers to 12 Typical

Summer Air Conditioning Problems

Servicemen expect their boss to quickly and accurately solve difficult service problems. How good are you with the 12 questions asked?

EVERY WELL-RUN manufacturing or merchandising organization pauses once a year to make a survey of inventory, or as it is sometimes put, to take stock. This procedure consists primarily of a count of physical assets for the purpose of verifying paper records that have been kept over the year.

In the manner of an annual inventory, we are proposing, as 1961 draws to a close, that the air conditioning dealer-contractor take stock of his technical know-how. This knowledge is as important to him as are his physical possessions. In the type of business he conducts, expert application and service advice must be available at all times in order to sell successfully the products on hand.

Here are the answers to the 12 questions asked on page 34 and on 37. Were you able to answer nine of the 12 questions correctly? If you did, you've earned a passing grade. If not, follow this series throughout 1962 as each of these questions is explored more fully and a step-by-step diagnosis is made of each problem.

Here are the questions and answers:

1. What cfm is Needed?

The relationship of air quantity to cooling load can vary reasonably over a limited range of, say 350 to 450 cfm per ton. Based on the average of



How to Identify the Refrigerant Used In an Air Cooled Unit

Solving Problems continued . . .

400 cfm per ton, the stated load of 40,000 Btu/h (3½ tons) will require about 1330 cfm.

2. Will Blower Handle Cooling Load?

The approximate capability of a double width, double inlet furnace blower operating against 0.2 in. external resistance pressure is 800 cfm for a 9 in. diameter wheel, 1200 cfm for a 10 in. wheel and 1800 cfm for a 12 in. wheel.

When the resistance of a cooling coil is added to a given warm air system, the air flow will drop in percentage only about 1/3 as much as the percentage increase in resistance. If the resulting air flow is estimated to be no lower than 350 cfm per ton (as noted in the answer to question No. 1), no change in blower speed need be made. If the estimated air flow is lower than the minimum, it can be increased in direct proportion to an increase in blower speed. The required hp, however, will rise as the cube of the speed ratio. Motor input should be checked carefully to determine if it is necessary to increase motor size.

3. What is Air Mixture Temperature?

Let us assume that 80 percent inside air at 80 F db and 67 F wb is mixed with 20 percent outside air at 95 F db and 75 F wb, and that we are to find the condition of the mixture in order to select a cooling unit.

$$\text{Dry bulb temperature of mixture} = (0.8 \times 80) + (0.2 \times 95) = 83 \text{ F}$$

Wet bulb temperature of mixture from using psychrometric chart:

Grains of vapor per lb dry air, inside air = 78

Grains of vapor per lb dry air, outside air = 98

$$\text{Grains of vapor in mixture} = (0.8 \times 78) + (0.2 \times 98) = 82$$

Wet bulb temperature at 83 F db, 82 grains = 68.5 F wb.

4. One Room Doesn't Cool. Why?

The cooling load for the house was undoubtedly calculated by using a form that was filled in by the dealer-contractor. This provides the peak overall load (which usually occurs late in the afternoon) necessary for sizing the cooling equipment. It does not necessarily show the peak cooling requirement for each individual room since these peaks follow the sun and do not occur simultaneously.

The problem room with its east and south exposures has a peak cooling load occurring prior to the 4 p.m. time used for the load calculation. The peak requires more than the 200 cfm allotted to this room. The dealer-contractor should be on the lookout for special problem rooms such as this and make the necessary peak load calculation to assure that provision for adequate cooling will be made in the system design. There are various solutions to this problem. If glass areas are large, shading may be all that is needed. If the peaks are severe, zoning of the supply air may be required.

5. Use Storm Windows During Summer?

Although storm windows are more of a help in the winter when greater inside-outside temperature differences and more severe infiltration exist, they should certainly be used in the summer also for a house which is air conditioned. The extra glass does not change the amount of solar heat entering by direct radiation, but it does reduce the amount of conducted heat by creating the insulating air space. The reduction in heat gain would be reflected in operating cost.

6. Which to Use, 3-ton or 2-ton Unit?

The dealer who offered the 2 ton unit probably admitted to the owner that his unit was slightly undersized for the load as compared with the 3 ton unit which was definitely oversized. However, he

no doubt pointed out that for all except the peak condition, the smaller unit could maintain the desired dry bulb temperature, and because of its smaller capacity, it would have longer periods of operation than would the larger unit. He surely clinched the story by showing that long periods of operation would mean longer periods of reduced humidity.

The owner was told to expect a slight creep upward of the indoor dry bulb temperature during peak loads, but must have been convinced that he would hardly notice this if the humidity were kept low by keeping the conditioner operating.

7. What is Correct Head Pressure?

With 95°F air entering an air cooled condenser, one could reasonably expect to find a condensing temperature of about 115°F with corresponding pressures for R12 and R22 of 146.3 psig and 245.3 psig respectively. The 205 psig condensing pressure would have corresponding temperatures of 140°F and 103°F for R12 and R22, respectively.

A high refrigerant R12 condensing pressure and temperature could result from a dirty condenser, reduction of condenser air, an overcharge of refrigerant or from the presence of air in the refrigerant. Since the unit was serviced recently, the condenser can be assumed to be clean and operating with proper air flow. An overcharge and air in the system are ruled out by the problem statement. The conclusion, therefore, is that the system must contain R22 and that the condensing pressure and temperature are low.

If the conclusion above is correct, the cause could be refrigerant shortage (ruled out by the conditions of the problem), obstruction in the refrigerant circuit (defective expansion valve, clogged strainer, line kink, partially closed service valve) or a defective compressor (broken valves, leaky rings or gaskets).

8. When Should Sequential Starting be Used?

The choice of a single 5 ton air conditioner or a 3 ton plus a 2 ton unit would depend upon several factors. The single unit would be more compact and probably lower in cost. There are several reasons why the other combination might be chosen, however. For example, the two units would lend themselves nicely to zoning whereby the owner might wish to cool only part of the house on certain occasions. If zoning were not the reason, the two units could be used together in a step control arrangement to provide better humidity control than would be possible with on-off operation of a single unit. A final reason for the two-section choice might be to meet local power company regulations.

(Continued on page 72)

12 Questions

Continued from page 34

7. What is correct head pressure?

Hypothesis — An air cooled unit is found to have an operating head pressure reading of 205 lb on a 95°F day (the unit is located in the shade). An inquiry of the customer indicated it had been serviced recently by another company. What can account for the head pressure reading when it doesn't correspond to either R-12 or R-22 and the service procedures do not indicate overcharge, undercharge or air in the system?

8. When should sequential starting be used?

Hypothesis — A total heat gain of 60,000 Btuh requires the selection of cooling equipment. Should it be a single 5-ton unit or a 3-ton plus a 2-ton unit?

9. How do long lines on a remote unit affect operation?

Hypothesis — A remote air cooled condensing unit with 40 ft of refrigerant lines was installed during early summer and has operated satisfactorily until a hot spell occurs. The equipment now appears to have inadequate capacity. Service checks indicate the refrigerant charge is correct. The heat gain estimate is checked and found to be accurate, and the unit functions correctly. What can have been overlooked?

10. Installed undersized supply. What can be done?

Hypothesis — One room of a house cannot be cooled properly as compared with satisfactory temperatures in the rest of the house. A check shows that the installer misread the drawing and put in a 5 instead of a 7 in. duct as required. What can be done?

11. How to avoid drafts?

Hypothesis — A customer complains of a draft across the very portion of a room where his favorite easy chair is located. What should the dealer-contractor look for?

12. Noise — how is it minimized?

Hypothesis — A prospect seems to be particularly interested in the problem of noise in an air conditioning system you are trying to sell him. Can you convince him you understand how to prevent noise from being the problem he thinks it is?

Industry Charts Progress At National Level



CONGRATULATIONS are extended incoming president Don Winegardner, Majestic Co., (left) by Harry C. Gurney, Janitrol, who had just completed two terms as NWAHACA's president.

48TH ANNUAL convention of National Warm Air Heating and Air Conditioning Association in Chicago heard encouraging reports from Indoor Comfort Bureaus on the Silver Shield Program.

WHOLESALERS, manufacturers, dealer-contractors and utilities see indications of business improvement during 1962.

RENEWAL of field research program planned to coincide with goals set for laboratory research at University of Illinois and mild weather research residence testing at San Jose, Calif.

FIRST STEP taken in the formation of 11 regional dealer councils where elected delegates will pick a chairman to represent them on a national dealer's advisory council. Regional chairmen will keep the association and its board of trustees informed on needs at the dealer-contractor level.

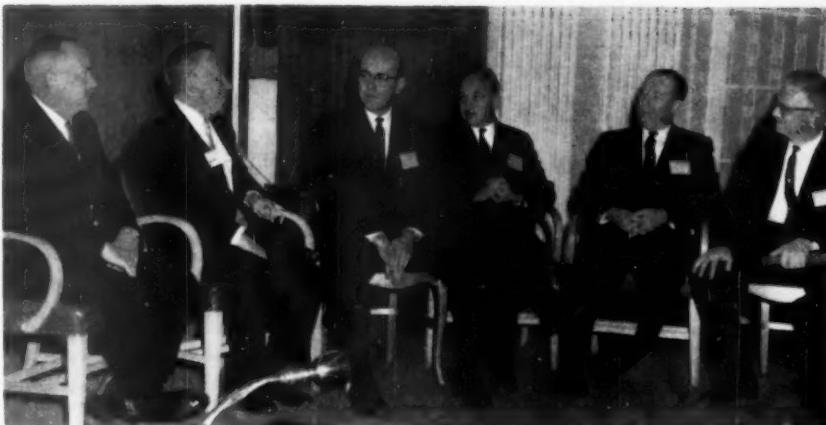


NATIONAL Silver Shield Dealers elected (l to r) Norman Shannon, Shannon & Co., Omaha, secretary; W. R. Fleck, M and T Furnace Co., Cleveland, chairman; and Clem Alexander, Johnson Furnace Co., Kansas City, vice chairman.



SAMPLES of the Silver Shield promotion program conducted by the Indoor Comfort Bureau of Greater Kansas City were exhibited by Clem Alexander, president of the bureau, for the benefit of representatives from other cities where Silver Shield programs are in use.

MARKETING session had as panelists (l to r) A. W. Beck, Robertshaw-Fulton Controls Co.; Chet S. Stackpole, American Gas Association; George M. Hase, Mueller Climatrol, Div. of Worthington Corp.; J. Orville Garrett, Loman-Garrett Supply Co.; J. P. Field, The Williamson Co.; and Randall A. Nelson, National Warm Air Heating and Air Conditioning Association. Each panelist suggested ways for manufacturers, wholesalers, dealer-contractors and utilities to effectively coordinate their sales promotion activities during 1962



TECHNICAL and application data were presented by panelists (l to r) James H. Healy and Murray Patterson, University of Illinois; Kendall H. Flint, Gas Vent Institute; T. R. Casberg, Department of Defense; and Otto J. Ress, Mueller Climatrol, Div. of Worthington Corp., who moderated the program. Subjects covered included reports on research studies dealing with modulated input to gas furnaces and electric duct heaters, flue gas venting and equipment specifications for military housing projects



AWARDS for outstanding service to the industry were made to (seated, l to r) Gordon Rieley, Lennox Industries; Francis W. Kerscher, Frank J. Kerscher Co., Manitowoc, Wis.; George Primich, G. W. Berkheimer Co., Inc., Gary, Ind.; Charles H. Franke, American Furnace Co.; Homer F. Brundage, The Brundage Co.; Harry C. Gurney, Janitrol. (Standing) Glen W. Rynbrand, Glen W. Rynbrand Co., Kalamazoo, Mich.; Terry Hart, Nashville Gas Co.; J. Orville Garrett, Loman-Garrett Supply Co., Greensboro, N.C.; Dick Schrader, F. O. Schoedinger, Inc., Columbus, O.; Joe M. David, Lewis David Co., Decatur, Ill.; and Clyde H. Wilkinson, American-Standard Co.



Looking At Residential Humidification

By John M. Liebmann
Chief Design Engineer
Research Products Corp.



To What Degree Does Infiltration Affect the Humidity in a House?

**Factors involved vary with outside
air temperature,
its moisture content, wind
direction and
velocity**

In AMERICAN ARTISAN for November a standard method for rating humidifiers was proposed. The suggestion was based on research data obtained from a typical house located in Madison, Wis. Further information is presented this month to show how infiltration of outside air has an effect on the amount of water vapor needed to maintain the 35 RH at 72 F inside design conditions recommended.

Air Rate Change Determined

The air rate change can be determined by either the crackage method or by the estimated air change method. The total volume of the author's house is 23,400 cu ft, including the basement. This volume holds approximately 1700 lb of air. If the humidification siz-

ing were based on one air change per hr, the humidifier output requirements for this case would be: $(1700 \text{ lb air per hr} \times 0.0047 \text{ lb water per lb air}) - (0.5 \text{ lb water per hr}) = 7.5 \text{ lb of water per hr}$. For one half air change this would be 3.5 lb and in the case of two air changes 15.5 lb of water would have to be added to the air each hour. The air change rate will be calculated by the two methods shown in Table 1.

The estimated air change method might indicate that a 0.67 change would occur during an hour. The figure 0.67 is obtained by dividing the cubic contents of the house, 23,400 into 15,745, the air infiltration as shown in Fig. 1. This value is somewhat higher than one obtained by the crack method using a 15 mph value of 24 cu ft of air per hr per ft length of

crack. Using this basis and assuming the wind is from the northwest direction, the greatest crack orientation, the air volume change would be $(259 \text{ ft of crack} \times 24 \text{ cu ft of air per hr})$ equal to 6200 cu ft per hr or 0.265 changes per hr. This latter value seems too small to the author.

Crack Method Checked

For example, with the crack method we would obtain a value of 800 cu ft of air change in the basement during an hour. This particular basement contains gas appliances that need approximately 10 cu ft of air for every cu ft of gas consumed. 150,000 Btu/h of burned natural gas would require nearly 1700 cu ft of air. If the gas-fired clothes dryer operated for an hour, it would exhaust 9000

TABLE 1 — COMPARISON OF the two available methods of determining air infiltration in a Madison, Wis. house

| Room | Estimated Change Method | | | Crack Method-Feet | | | |
|-----------|-------------------------|-----------------|------------|-------------------|------|-------|------|
| | Cubic Volume | Air Rate Change | Air Volume | South | West | North | East |
| Basement | 8200 | 1/2 | 4100 | 16.0 | 16.0 | | |
| 1st Floor | | | | | | | |
| Study | 1200 | 3/4 | 900 | 20.0 | 16.3 | | |
| Playroom | 1200 | 3/4 | 900 | | 16.3 | 16.3 | |
| Bath | 550 | 1/2 | 275 | | | 16.3 | |
| Kitchen | 1150 | 1/2 | 575 | | | 56.3* | |
| Dining | 950 | 1 | 950 | | | 40.0* | |
| Living | 2500 | 1 | 2500 | 40.0 | | | 20.0 |
| Hallway | 1000 | 3/4 | 750 | 42.0* | | | |
| 2nd Floor | | | | | | | |
| Bedroom | 2150 | 3/4 | 1605 | | 16.3 | 16.3 | |
| Bath | 550 | 1/2 | 275 | | | 16.3 | |
| Bedroom | 700 | 1/2 | 350 | | | 16.3 | |
| Bedroom | 2450 | 3/4 | 1840 | | | 16.3 | 16.3 |
| Hallway | 500 | 1/2 | 250 | | | | |
| Attic | 950 | 1/2 | 475 | | | | |
| Total | | | 15,745 | 118.0 | 64.9 | 194.1 | 37.1 |

*Equivalent window crack infiltration for door cracks

TABLE 2 — SAMPLES OF the psychrometric readings as collected over a 12 day period in a Madison, Wis. house

| Location | DB | Inside Conditions | | | Date, Time & Outside Temp. |
|-------------|------|-------------------|------|-----------|----------------------------|
| | | WB | RH | Abs. Hum. | |
| Basement | 64.5 | 49.0 | 30.0 | 0.00385 | 12/7/58 |
| Study | 70.0 | 53.5 | 32.5 | 0.00495 | Monday |
| Living Room | 73.0 | 55.0 | 29.5 | 0.00510 | 12:30 a.m. |
| Bedroom #2 | 67.0 | 52.0 | 35.0 | 0.00480 | 11 F |
| Bedroom #3 | 69.5 | 54.0 | 35.0 | 0.00530 | (Wash Day) |
| Basement | 65.0 | 48.0 | 25.0 | 0.00325 | 12/10/58 |
| Study | 71.0 | 52.5 | 26.5 | 0.00420 | Wednesday |
| Living Room | 73.5 | 53.5 | 24.0 | 0.00415 | 7:00 a.m. |
| Bedroom #2 | 70.5 | 53.0 | 29.0 | 0.00455 | -8 F |
| Bedroom #3 | 70.5 | 53.0 | 29.0 | 0.00455 | |
| Basement | 64.0 | 49.5 | 34.0 | 0.00420 | 12/11/58 |
| Study | 72.0 | 55.0 | 32.5 | 0.00535 | Sunday |
| Living Room | 74.0 | 55.5 | 29.0 | 0.00515 | 6:10 p.m. |
| Bedroom #2 | 70.5 | 53.5 | 31.0 | 0.00485 | 5 F |
| Bedroom #3 | 72.5 | 54.0 | 27.5 | 0.00465 | |

cu ft of air from the basement. Experience and judgment are now required to resolve these differences.

Similar Study Checked

A study on air infiltration in a house very similar in construction to the one in question was made by D. R. Bahnhfleth at the University of Illinois. Results are presented in the report, "Measurement of Infiltration in Two Resi-

dences." This study showed that a measured rate of 0.6 to 0.7 air changes took place when the wind velocity was 15 mph and the temperature difference was 45 F. With this background information, the author feels that the design calculation for this case should be at a 0.65 air change rate. This means that the house should be equipped with a controlled humidifier with a 4.7 lb of water per hr output, say a 5 lb per hr controlled unit. This will put out enough moisture

to meet the greatest requirement.

In order to get an actual feel of residential humidification, the author conducted a series of observations in his home. One part of the observations was to measure the dry and wet bulb temperatures at various portions of the house at different times of the day over a 12 day period. Samples of the collected data are found in Table 2.

During this 12 day period, the hair element humidistat control

Sizing Residential Humidifiers continued . . .

was set for a 30 percent relative humidity level. The humidistat is located next to the ceiling near the center of the basement. This control cycles the operation of the plenum mounted humidifier that has a capacity of 5.5 lb of water per hr for a furnace plenum temperature of 120 F. The humidistat microswitch mechanism has a response differential of about 2 percent relative humidity and the calibration setting of the control may be in error by another 1 or 2 percent.

Humidity Level Constant

On examination of the data, it becomes apparent that this was a period of cold outdoor temperatures, colder than average Madison, Wis., winter days. The author was a little surprised to see the amount of variation of dry bulb temperature from room to room while the relative humidity level remained fairly constant throughout the house. The only time a large variation of humidity occurred was when washing was hung in the basement. At this time the basement humidity was high while in the other rooms the level was lowered.

During this test period the living room fireplace was used three times. The fireplace damper was probably opened for about six hours during each fire. The author estimates that the air movement into the fireplace must have been in excess of 10,000 cu ft each hour, because air flow measurements on other homes indicated velocities of 50 to 150 feet per minute through the fireplace openings during periods when they were not in use. This air quantity would be greater during periods when there is a fire. The effect of the open fireplace and increased air infiltration was not apparent on the relative humidity level of this house. This would not be the

case in a home that did not have controlled humidification.

During the first heating season of occupancy the time elapsed meter indicated that the humidifier ran for only 96 hours during a 99 day period from December 18, 1958 to March 27, 1959. This is an average operation of 0.97 hours per day, or only 5.4 lb of water added by the humidifier each day. The second heating season time elapsed meter readings showed that from October 11, 1959 to April 1, 1960 the humidifier ran for 1020 hours. During this 144 day period, the unit operated for an average of 5.83 hours each day. This would mean that the humidifier averaged 32 lb per day or 1.35 lb per hr.

During the first heating season the humidistat was set for a conservative humidity level of 30 percent and this being a new home, a great deal of water was liberated from the plaster, concrete in basement, and other building materials. The second heating season is more typical and should be used as the basis of establishing humidifier performance. During this latter season, the humidistat setting was increased to 35 percent.

Close Correlation Made

It had been estimated that this house should be equipped with a 5 lb per hr humidifier. The data taken over a typical heating season showed that the average hourly requirement was 1.35 lb. How can this be reconciled? Actually this is the type of correlation one should expect. For example, this house is equipped with a 125,000 Btu input gas-fired furnace that could produce about 80,000 Btu of useful heat, yet the average winter heating load is only 35,000 Btu. All air conditioning equipment is sized for the maximum load. This should also be the criterion when selecting humidification equipment.

A review of this series of articles shows that:

1. Residential humidification is one of the fastest growing markets in the air conditioning industry. Manufacturers are now producing well engineered, high capacity, controlled humidifiers.

2. The homeowner will have to compromise between his comfort standard and moisture damage to his home. A safe humidity level would be one that would not allow condensation to appear on the glass surface of windows.

3. Some small, modern houses are built so tight that their problem is too much humidity. This can be solved with ventilation or dehumidification.

4. Many large or older homes need 10 to 20 lb of additional water vapor each hour in order to keep the occupants comfortable and the furnishings from drying out.

5. Homes in the northern United States should be equipped with controlled humidifiers that will maintain proper humidity levels. Ideally this control should sense the indoor humidity and the outside air temperature.

6. Humidification sizing is not difficult but it does require a certain amount of judgment. This is particularly true in the case of air rate change estimation. Also, the unit should be sized for the near maximum conditions.

The author would like to make the following recommendations:

1) All humidifiers should be rated in lb of water vapor per hr.

2) In humidification sizing, inside design conditions should be 35 percent relative humidity and 72 F dry bulb temperature; outdoor design should be based on 20 F dry bulb temperature and 50 percent relative humidity.

3) Additional studies should be made in more homes so humidity levels and humidifier sizing can be made more accurately.

AMERICAN **ARTISAN**

Sheet Metal Section

Ventilation
Architectural

Dust Removal
Specialties



STANDING SEAMS are used to join curved canopy pans p. 44

How to Fabricate a Curved Canopy Page 44

Builds Portable Screw Conveyor for Handling Trimmed Meat. Page 48

Chicago Fights Bid-shopping and Bid-peddling Page 50



HAND SEAMERS WERE USED to turn the edges of standing seams. Progress in completion of the order for 220 duplicate arched canopies is checked by L. H. Sohn (right)

How to Fabricate a Curved Canopy

**Provide allowance for expansion and contraction
due to weather changes,
use adequate reinforcement, and solder tightly**

"NEW BUILDING materials come and go, but the use of sheet metal in architectural application continues to have more to offer. One example," said L. H. Sohn, L. H. Sohn Co., Chicago, "is the lead coated copper roof for the Adler Planetarium and Astronomical Museum which was

given a 20 year guarantee at the time it was installed in 1940. There has not been one call for repairs during this 20 year period because the roof was installed according to good design and by skilled sheet metal craftsmen.

"Another well-known structure, Chicago's Navy Pier (east

end), had its copper dome installed in 1916; it has withstood the elements for 45 years without the need of service. These are but two of many outstanding architectural uses of sheet metal. At present, we are completing an order for 220 zinc covered arched entrance canopies for the

Chicago Housing Authority. The design of these canopies not only adds beauty to the buildings, but also provides installation specifications for service-free maintenance."

The buildings on which the 4 x 8 ft arched entrance canopies will be installed were designed by architect S. A. Lichtman, who personally inspected the first canopy before giving his approval for the fabrication of the remainder of the order.

Precautions Taken

In constructing the canopies, Mr. Sohn instructed his employees to allow adequate space for the sheet metal to expand and contract as air temperatures changed with the seasons, and to use reinforcement at all exposed points to retain the original shape and appearance. Another precaution taken in the fabrication of the canopies was to use heavy duty, properly tinned and correctly heated soldering irons to assure weathertight seams where the metal was joined at other than standing seams.

The sheet zinc used was 0.020 and was cut to order at the distributor's plant. The size ordered was 19 1/2 x 100 inches. By ordering the sheets in these dimensions, it is practical to form one pan that runs from one edge of the canopy to the other, and to cover the canopy from front to back with three pans of equal width.

The pans are formed in the press brake by turning one 90 deg bend along one side for a 1 1/2 in. flange. On the opposite side of the sheet, and in the same direction, is a second 90 deg bend with a 1 3/4 in. flange.

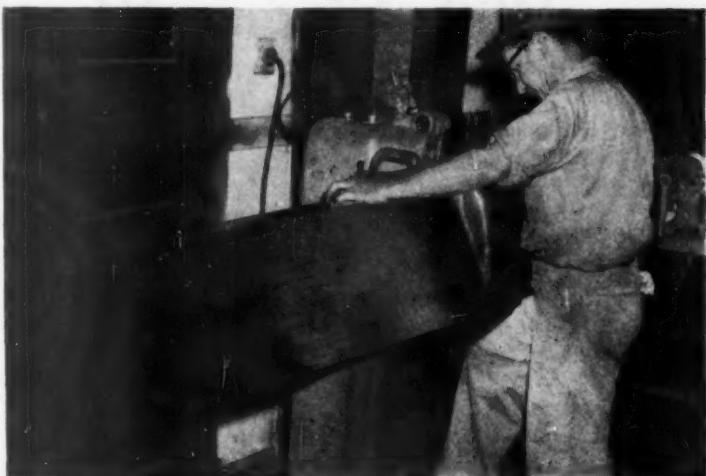
These pans are formed in large



EDGE STRIPS were formed by welding a pre-cut curved sheet to a 1 x 1 in. curved angle



EDGE STRIPS were attached by nailing the 1 in. wide 90 deg flange to the underside of the canopy frame



PANNED FLANGES were put through a power roller to stretch the edges which, in turn, curved the pan to match the shape of the curved canopy



TURNED standing
seams are malleted
against dolly to form
a tight joint

continued . . .

Standing Seams Provide Canopy With Lifetime Weather Protection

quantities and stored until ready for bending to match the arc of the canopy.

Bending the Pans

Matching the arc of the pans with that of the canopy frame is accomplished by passing the pan through a powered roller which stretches the outer edge of the flange, providing the small degree of curve required.

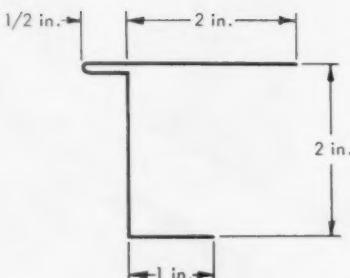
Fabrication of the arched canopy is started by placing a 2 in. preformed 4 x 8 ft laminated

wooden frame upon a pair of saw horses, curved ends up. In this position, the underside of the canopy is facing up. To the 4 ft edges, which become the sides, is attached a pre-formed end piece. These end pieces (of zinc sheet material) are formed according to the dimensions and shape shown in Fig. 1. The lower flange (1 in.) is nailed to what will be the underside of the canopy frame. Nails are placed on 8 in. centers. The top flange is not fastened. When these end pieces have been installed, the

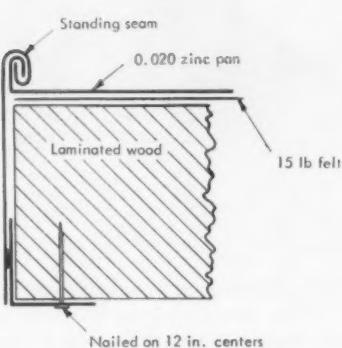
canopy frame is turned over.

The next step in the fabrication of the canopy is successively placing the curved pans in position on the canopy frame. This frame is first covered with a 15 lb felt. Each pan is fastened to the canopy frame with 2 in. cleats held by two nails and notched down the center to permit fitting the cleat to the curved flange of the pan. Cleats are installed on 12 in. centers. The underside of each pan is protected from the nail heads by bending the back end of the cleat over

1 END PIECE for terminating pan permits weathertight seam and limited movement caused by expansion and contraction



2 EDGE STRIP construction details show a standard standing seam where the edge strip is joined to the pan and a spot welded angle to hold the curved strip to the underside of canopy. The edge strip was spot welded to the angle on 1 in. centers

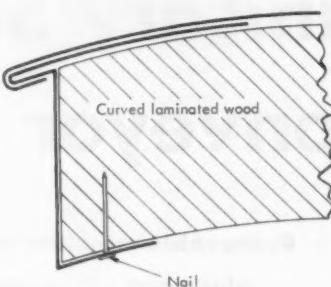


3 PAN ENDS are terminated by bending over the offset flange of the end piece and then malleted flush against the side of the canopy frame

the nail heads holding the cleat to the laminated wooden frame.

The second pan is attached to the curved canopy frame and a standing seam is formed by bending the longer flange over the shorter flange and then bending both flanges 180 deg. To form a tight joint, a mallet and a curved dolly are used to flatten the seam.

The curved dolly was made in the company's shop for this particular purpose. The dolly consists of two 1/2 in. flat iron bars, rolled in the powered slip roll former and then welded together. A handle is welded at



right angles to the flat surface. To the bottom of the curved dolly is attached a rubber-base fiber cloth to prevent the heavy dolly from scratching the zinc sheets. The dolly is held in the left hand and used to back up the seam which is malleted on the folded side.

Use Edge Strips

The dimensions of the pans provide complete coverage of the curved canopy from the front to the back edge when three pans are installed and two standing seams made. This leaves the front

and back edges of the canopy to be covered by edge strips.

Edge strips are formed by using 18 ga galvanized iron formed in the press brake to resemble 1 in. angle iron. This segment of the edge strip is then run through the powered roller to achieve an arc that matches that of the curved canopy. To this curved angle is attached a sheet of 0.020 zinc sheet which has been pre-cut on a curve to match the outer edge of the canopy curve. The zinc sheet is attached to the 1 x 1 in. curved angle iron by spot-welding at 1 in. intervals.

When the edge strip is completed, it is attached to the underside of the canopy frame by nailing on 12 in. centers. A standing seam is used to join the edge strip to the pan (see Fig. 2).

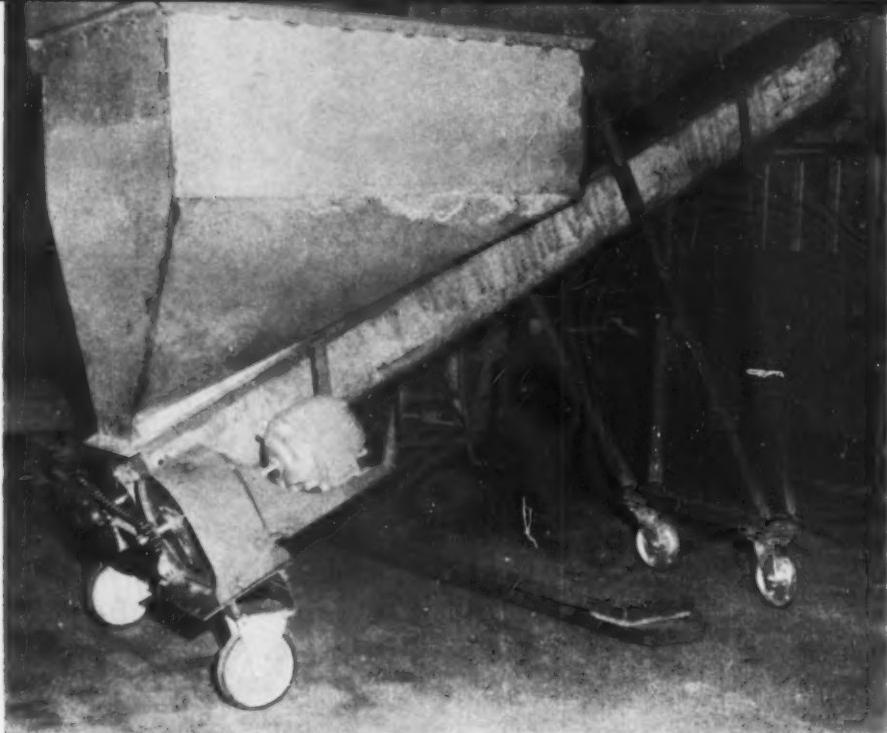
In preparing the edge strips, it was found they are more easily fabricated if they are made in two sections. The joint between the two sections is hand soldered to provide a weather-tight seal. An offset lap seam was used to provide strength at the soldered joint.

Join with End Pieces

Sheet metal work on the canopy is completed by joining the pan ends with the end pieces installed at the beginning of the fabrication. The ends of the pans are bent over the protruding lip of the end piece as shown in Fig. 3, and then malleted against the side of the canopy.

When completed, the canopies are delivered to the job site and attached to two 3 x 6 in. struts that had been installed in the masonry wall over the entrance-way. These struts are protected by an 8 in. covering of 0.020 zinc sheet, with 4 in. being inserted into the masonry wall and 4 in. covering the exposed strut.

For this particular job, about 45 lb of zinc was used to cover each of the 48 sq ft canopies.



PORTRABLE CONVEYOR assembly for handling trimmed meat in a packing house utilizes a 9 in. screw to move trimmed meat segments to fixed conveyor which feeds equipment located in the rendering room

How A Sanitary Screw Conveyor is Made

**Removable stainless steel covers
plus open top tapered hopper
permit steam scouring**

"IT SEEMS THAT no two jobs are ever the same in our shop," says R. V. Augustson, vice president, Hempel Sheet Metal Works, Inc., Omaha. "For example, this stainless steel conveyor for a meat packing company is the third one we've made for them, and each one was different in size and shape because of the type of trimmed meat being handled."

The conveyor utilizes stainless steel throughout for those portions that come in contact with the trimmed meat.

Other portions of the convey-

or such as the frame, chain drive guard, and base plates are fabricated from black iron.

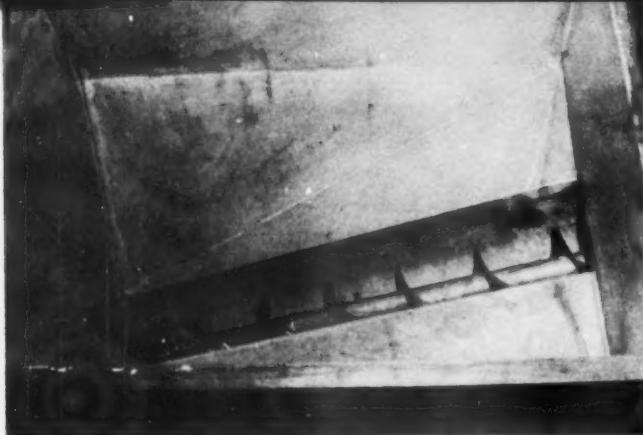
Conveyor Made Portable

The conveyor is mounted on casters so that it can be moved from one location to another within the packing plant. As it is used to move trimmed meat from newly butchered animals to the rendering section of the packing plant, the portable conveyor is moved under a stainless steel chute connected to the butchering room located on the floor

above, where the meat trimming operation is located. As the trimmed scraps of meat fall through the chute to the conveyor's hopper, it is moved by a screw through a 9 in. tube to a conveyor system that moves the meat scrap to the rendering department.

The conveyor, being mounted on casters, is easily moved to a scouring room where it is sanitized before being used the next day.

It was necessary to fabricate the screw conveyor tube with a flat top that would permit its re-



INTERIOR OF HOPPER was slanted to match 25 deg angle of screw conveyor



ATTACHMENT OF removable cover for scouring screw is discussed by R. V. Augustson (left) and journeyman Karl Uhlhorn

removal during the sanitizing process, since this was the only way to clean the entire 10 ft stainless steel screw.

The hopper, which is 48 in. long and 36 in. wide, varies in depth from 18 in. at the front end to 42 in. at the opposite end. It is fabricated from 16 ga 304 stainless steel. The screw is fabricated of 12 ga stainless steel welded to a 1½ in. solid stainless steel rod. The screw tube was fabricated from 14 ga 304 stainless steel. The screw was set on an angle to produce a 25 deg rise, with the hopper being fabricated to meet this angle at all points along its joint with the screw section.

The hopper and the screw tube cover are joined to the screw section with stainless steel bolts set on 15 in. centers. All

other joints in the fabrication of the hopper and conveyor tube were welded, ground down, and polished.

The frame of the portable conveyor utilizes the structural features of the hopper and screw section along with angle iron braces to produce a rigid, yet easily handled product. The angle iron frame ($1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$ in.) was built around the top of the hopper, to which vertical supports for the front legs of the conveyor were attached. The front legs consist of four angle iron supports (two on each side of the conveyor) connected to a 6 in. channel to which had been fastened two 8 in. free swinging rubber tired casters. The angle iron was set to provide vertical support to both the screw tube and to the hopper.

One angle iron support was attached to each of these parts, and on each side of the conveyor.

The lower end of the hopper rests upon a flat, black iron $\frac{3}{8}$ in. frame which forms the upper portion of the base for one set of in-line casters. This portion of the frame also supports a 1 hp electric motor and gear reduction assembly for turning the 8 ft stainless steel screw.

Caster Base Leveled

Because the flat frame was set to 25 deg to match the rise angle of the screw tube, it was necessary to fabricate and weld caster supports to match this variation in rise. This was achieved by extending one leg of the caster support until it became parallel to the floor. Thus, a level base for the caster was provided.

Serve Food Industries

This conveyor is but one of the many varieties of special equipment orders received by the Hempel company. They specialize in providing sheet metal products needed by the bakery, dairy, brewery, the meat packing industries located in Nebraska, Iowa, and Missouri.

Hempel Sheet Metal Works was founded by Ben Hempel in 1892. He and his two sons, Barney and Otto, operated the business. After the death of Ben and Otto, Barney with his two sons, Barney Jr. and Robert, managed the growing company.

Barney Sr. died in 1948, followed by Robert in 1956 and Barney Jr. in 1961, whose son Robert is currently managing the company under Mrs. Barney Hempel, now president. R. V. Augustson is vice president, with Jack Jacobsen as foreman. The office work is under the supervision of Mrs. Eleanor Haupt.



SHEET METAL contractors came from many cities to get information about the plan. From left are: Ralph A. Nicholas, Kansas City; Ralph J. Potesta, Gary, Ind.; R. J. Horst and Frank Schneider, Buffalo; K. L. Kimmel, Detroit; Frank J. Fitzgerald, Elgin; L. B. McConnell and Jack Langhorn, Lansing, Mich.; and Bill Schwenk, Kansas City

Chicago Gets New Bid Plan

Mechanical specialty contractors, architects, consulting engineers, general contractors and building owners wholeheartedly approve separate bids to counteract the practices of bid-shopping and bid-peddling

THE NEW CHICAGO PLAN For Separate Bids is an effort on the part of the Construction Industry to assure a building owner that workmanship and materials used to construct his building will more than meet the minimum specifications. This is possible because the plan requires that all contractors meet certain standards of qualifications. These standards are in the process of development now and will be compatible with those being formulated by the State of Illinois.

Expand Earlier Plan

The new Chicago plan is an outgrowth of the Chicago Plan for Separate Mechanical Specialty Contracting Bids introduced in 1960 (American Artisan, September 1960, pages 52-56). The new Chicago plan has been expanded to include the whole construction industry rather than a single segment, as was the case with the first plan.

The new Chicago plan recom-

mends that the architect and engineers establish, with the cooperation of the general contractors and the mechanical specialty contractors, a procedure for all building construction, under which they would proceed as follows:

- A. Prepare separate specifications for each of five categories of work as follows:
 - 1) General construction.
 - 2) Plumbing and sewerage.
 - 3) Heating, piping, refrigeration and automatic temperature control systems.
 - 4) Ventilating and distribution systems for conditioned air.
 - 5) Electrical installations.
- B. Include in the general construction specification an estimated percentage of the total cost of the project as represented by the mechanical specialty contracts.

Define General's Obligation

- C. Stipulate in the general construction specification a re-

quirement that each general contractor certify that a reasonable and controlling portion of the work included in his contract will be done by his own labor force.

- D. Take separate bids for each of the listed categories of work from a specific number of pre-qualified bidders.
- E. Let a general contract to the low bidder on general construction and award contracts, in consultation with the general contractor, to the low bidders in each of the categories of mechanical specialty work.
- F. Assign the mechanical specialty contracts to the general contractor by formal notice in writing, with copies to the mechanical specialty contractors concerned.
- G. Having first been satisfied as to the general contractor's financial responsibility, stipulate in the general contract that each contractor's initial monthly request for partial payments shall be accompanied by waivers for each immediately preceding partial payment. Final payment, however, is to be issued only in exchange for final waivers.

(Continued on page 71)

STORM TIES UP TRAFFIC: POWER LINES LEVELED

CITY BLACKED OUT FOR 6 HOURS

BLIZZARD PARALYZES STATE

RECORD COLD HITS EAST FOLLOWING BLIZZARD

PIPES FREEZE UP DUE TO POWER FAILURES

SLEET STORM DOWNS POWER LINES

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operate
during
power
failure

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Can "Sales Talk" Impose Legal Liability?

... according to the courts, "sales talk" or "puffing" does not amount to actionable misrepresentation when the parties involved have equal means of judging the property being sold

WHEN A SALESMAN of air conditioning equipment in one of the southern states was asked by a prospective buyer about the quality and fitness of certain air conditioning units, the salesman assured the customer that the equipment would perform as well or better than any other air conditioning unit on the market.

Fraud Suit Filed

Later, when the equipment failed to operate as was expected, suit was brought by the purchaser against the dealer-contractor for damages which the buyer contended he had suffered through the fraud and deceit of the dealer-contractor's salesman.

In determining the action, the court referred to a decision of a fraud suit brought several years before by a customer of a bank which had assured the buyer that certain bonds offered for sale were "gilt edged and as good as gold." Within a year after he had purchased the bonds, the customer learned that the company which had issued them was in financial difficulties and could pay neither principal nor interest.

"The bank defended by a denial that the stated representations were made by its officer and further, that even if the alleged misrepresentations had

been made, they were assertions of opinion only, which would impose no legal liability on the bank. As to the representations that the bonds were 'gilt edged and as good as gold,' we think the contention of the bank is well taken."

Precedent Set by Court

The law relating to sales talk or "puffing" was expressed many years ago by a federal court in a summary that has since become authority. By a seller, in that instance, it had been asserted that the equipment he was marketing worked completely and thoroughly, and that perfect satisfaction would result from its use.

The characterization made by that court of this and similar statements was: "They raise therefore a question of law — how far can general 'puffing' or 'dealer's talk' be the basis of an action for deceit? The conceded exceptions in such cases have generally rested upon the distinction between opinion and fact, but this statement has not escaped the criticism it deserves.

"An opinion is a fact and it may be a very relevant fact. An expression of an opinion is the assertion of a belief; any rule which contains the expression of a consciously false opinion con-

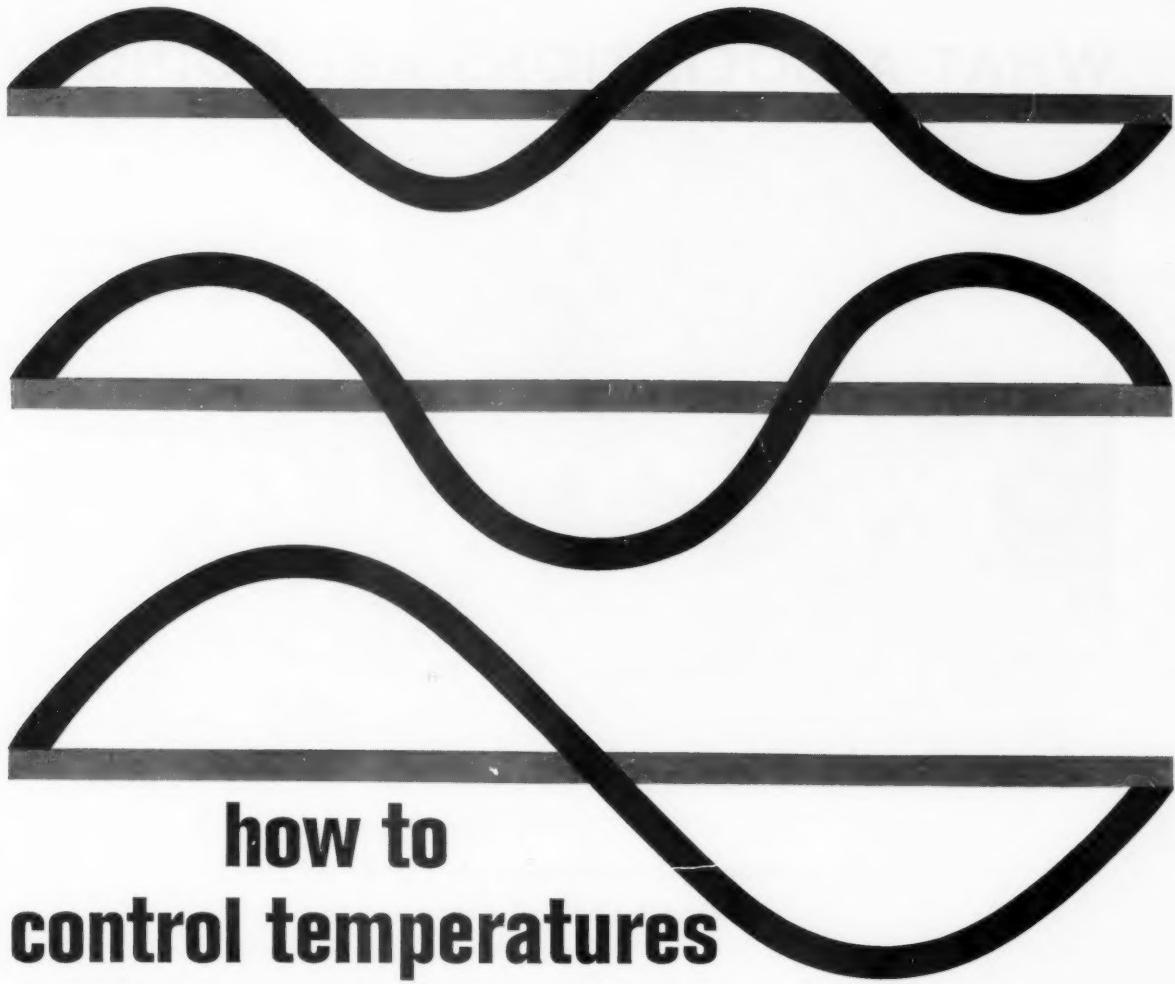
tains a consciously false statement of fact."

No Misrepresentation

Basing its conclusion on this and similar decisions that have been rendered through the years, the southern court, in absolving the dealer-contractor from fraud in the sale of this equipment, said: "In our opinion the so-called misrepresentations were words of general commendation of the units offered for sale, and were not such as to constitute actionable misrepresentations.

"It is a broad generalization, usually observed in cases involving issues of fraud attempted to be predicated thereon, that a commendatory language is not construed as importing a representation on which a charge of fraud may be based.

"Applying this principle to the factual business transactions in which the question most often arises, the rule is well settled. Mere commendations of property sought to be sold — commonly known as 'trade talk,' 'dealer's talk,' 'seller's talk,' or 'puffing' — do not amount to actionable misrepresentations in situations where the parties deal at arms' length, have equal means of information, and are equally qualified to judge the value of the property sold."



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WHAT ASSOCIATIONS ARE DOING



JOE STYDAHAR, well-known football star, advises graduating sheet metal apprentices to set goals for themselves that will retain the drive that made it possible for them to complete their exacting four year indenture

Set Goals That Will Lead to Success

... ex-football star advises
graduating apprentices. Joe Stydahar tells
what lies behind star performance —
on the gridiron or in business

"THE 'WILL TO WIN' is an element essential to success on the gridiron. This same attitude is required in the commercial world if a man wants to receive recognition for the work he does," said Joe Stydahar, as he addressed an audience of more than 400 heating and air conditioning dealer-contractors, sheet metal contractors, journeymen and their wives. The occasion marked the awarding of certificates of completion to 14 apprentices who had finished four years of training under the Joint Apprenticeship Training Committee of Local 303, Sheet Metal Workers' International Association and the Lake County Sheet Metal Contractors' Association serving northwestern Indiana.

Mr. Stydahar was head coach of the 1951 championship Los Angeles Rams. He was a tackle for the Chicago Bears (1936-1946) and, prior to his professional football career, was a college All-American tackle.

In his address to the graduating apprentices, he pointed out that competition in business, on the job and in sports is similar in many respects. Speed, size, alertness, intelligence and appearance are all desirable characteristics, but none is so important as the desire to achieve obtainable goals.

He compared the functions of a football coach with those of a dealer-contractor, pointing out that both have the responsibility for good management and guid-

ance. Well-planned apprenticeship programs develop good morale, which is needed to produce confidence in other members of the team: fellow workers on the job, in the shop, at the engineering table and in the office. When good morale exists, he said, a good job is accomplished with satisfaction guaranteed to the customer.

In congratulating the graduates, Mr. Stydahar noted that the apprentices had already developed many of the desirable traits that contribute to good team spirit. For example, their desire to win had prevailed during the immediate past four years when others who started at the same time had failed and dropped out.

(Continued on page 56)

New Materials Call for Expanded Training Programs



REVISION of existing apprentice training programs to include instructions related to fabrication and installation of plastic duct systems was discussed by panelists (l to r) Howard Houchens, Chet Nowak, John Klatt, R. S. Schmieder, William A. Kuechenberg and Joseph J. Kaberlein

CHICAGO — Introduction of new materials for use in the construction of buildings has made it necessary to review the skills required of those who fabricate and install new products. To discuss revision of current apprentice training programs, dealer-contractors, association secretaries, labor leaders, government employees and school board members from Wisconsin, Illinois and Indiana recently held their second annual North Central States Apprenticeship Conference.

Problems common to all skilled trades were discussed in a general session held the morning of the first day followed by special sessions for each of the 10 trades represented.

Cite Growing Plastic Uses

In the sheet metal meeting, the growth in the use of plastic

materials as substitutes for sheet metal was extensively discussed. Experience needed by journeymen in fabricating and installing this material was pointed out by an eight-man panel. Representatives from each state consisted of two men — one representing management, the other labor. Two other panelists represented educational interests. Panelists were: Illinois — William A. Kuechenberg, R. B. Hayward, Co., Chicago, and Joseph Kaberlein, Sheet Metal Workers #73, Chicago; Wisconsin — Robert Schmieder, Wisconsin Sheet Metal Contractors Association, Milwaukee, and John Klatt, Sheet Metal Workers Union #24, Milwaukee; Indiana — Howard Houchens, Apex Heating Shop, Inc., Gary, and Chet Nowak, Sheet Metal Workers #303, Hammond; educational interests — James Hale, consultant,

Bureau of Apprenticeship and Training, U. S. Department of Labor, Chicago, and Andrew J. Scholar, Chicago Board of Education.

Additional Skills Needed

Details of plastic application, fabrication and installation were given by E. B. Brown, III, Corite-Reynolds Corp., Chicago, and Harold LaBeck, Joseph T. Ryerson & Sons Co., Chicago. The skills required in addition to those of a sheet metal journeyman to produce a quality plastic product were presented.

Among the more important skills required is the art of hot air welding of plastic materials. It's estimated that a minimum of 60 hours is required to teach the fundamentals, characteristics of plastic materials when being

(Continued on page 56)

WITH THE ASSOCIATIONS

Continued from page 55

Good Training Program Vital to Industry's Growth



"OUR INDUSTRY'S FUTURE is in the hands of young fellows such as yourself," James E. McClellan, president, The Ventilating and Air Conditioning Contractors' Association of Chicago, tells graduating apprentice Robert G. Applequist (left). At right, James T. Tracy, secretary-treasurer, Local 73, Sheet Metal Workers' International Association, stands ready to add his congratulations.

CHICAGO — "The success of any industry — and of the skilled trade that serves it — is based on the effectiveness of its employee training program. The sheet metal apprenticeship training schedule we have in the Chicago area assures a bright future for those serving this industry either as journeymen or as contractors," said A. H. Cronin, president and business manager, Local 73, Sheet Metal Workers' International Association, as he addressed 52 graduating apprentices at the annual dinner sponsored by the Joint Apprenticeship Committee.

'Be a Credit to Your Union'

In charging the new journeymen with their responsibility to the trade and their employers,

James T. Tracy, secretary-treasurer, Local 73, said: "All of those who have gathered here tonight to help celebrate the satisfactory completion of your apprenticeship have come to show their continued interest in you. Return their interest by being a credit to your employer and your union."

Many Groups Represented

In addition to the graduating apprentices, dinner guests included sheet metal contractors representing The Ventilating and Air Conditioning Contractors' Association of Chicago, The Sheet Metal Contractors of Greater Chicago, The Air Conditioning Contractors' Alliance, and The Blow Pipe and Dust Control Industry of Chicago as well as

Stydarah Addresses New Journeymen

(Continued from page 54)

Master of ceremonies at the banquet was Chester Nowak, business manager for Local 303. The Certificates of Completion were awarded by Howard Houchen, dealer-contractor chairman of the Joint Apprenticeship Committee.

Discuss Growing Uses of Plastics

(Continued from page 55)

shaped, bent, formed, joined or welded. Journeymen will be taught how to recognize the best temperatures for forming a welded seam, molding round pipe, making 90 deg bends at duct corners and how to overcome the slight twists that occur in forming duct sections.

Milwaukee Program Revised

Present plans call for including plastic work in the revised Milwaukee apprenticeship training program that will begin with the January 1962 classes. This program has also been broadened to provide extra classes for sheet metal men who have previously completed their apprenticeship training that they might qualify for work assignments as applications for this material increase.

The next North Central States Apprenticeship Conference is scheduled for the fall of 1963.

instructors from Washburne Trade School, representatives of state and national bureaus of apprentice training, and members of the trade press.

(Coming Events on page 66)



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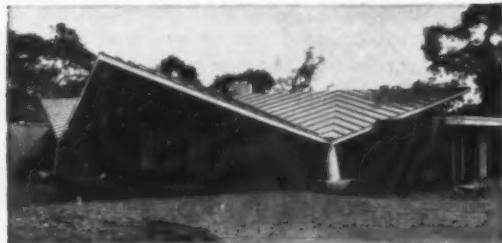


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Architect: Ray Parrish, Scottsdale, Arizona
Roofing Contractor: L & K Sheet Metal Roofing Co., El Paso, Texas



Residence: Elmer P. Gavello, Sunnyvale, California
Architect: Anshen and Allen, San Francisco, California
Roofing Contractor: Virgil Johnson, Sunnyvale, California

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Excited about Follansbee Terne...
the oldest "new" roofing material

The men who design today's modern buildings are specifying various types of Follansbee Terne roofs because Terne gives them the opportunity to combine distinctive form and color into the roof area. Batten and standing seams and the new horizontal, bermuda seam are being used on an increasing number of quality homes and on many new commercial buildings.

Shortly before his death, Architect Frank Lloyd Wright said of Terne, "...because of its inherent adaptability in both form and color, Follansbee Terne permits the visible roof area to become a significant part of structural design."

In a very practical sense, Follansbee Terne is a roofing material that will please both you and your customer.

Follansbee Terne gives outstanding, lifetime service; its ease of fabrication and its pricing structure assures the roofer that a Terne roofing job will give him a better profit.

If your shop hasn't been working with Terne lately, it will pay you to learn more about this new "old-timer" that is creating more and more interest among architects and builders everywhere.



Alexander Memorial Arena Building, Georgia Tech
Architect: Aeck Associates, Atlanta, Ga.
Roofing Contractor: R. F. Knox Co., Inc., Atlanta, Ga.

FOLLANSBEE STEEL CORPORATION
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The ROBERTSHAW *élégante* wall thermostat with the new Best switch...operates in any position, requires no leveling...this revolutionary magnetic switch operates longer, better....switch contacts permanently sealed in glass to protect against corrosion and linting.



For more information, contact: ROBERTSHAW-FULTON CONTROLS COMPANY
GRAYSON CONTROLS DIVISION • LONG BEACH, CALIFORNIA

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HEATING & COOLING

EQUIPMENT DEVELOPMENTS

INFORMATION on capacities, dimensions, applications, and special features in each Equipment Development item is presented in accordance with material furnished by the manufacturers.

Press Brake Features

Variable Speed Ram

THREE LIGHT DUTY press brakes are designed to provide maximum speed and other advantages such as variable speeds and adjustable rams as well as operating convenience and accuracy. Model 265 has an over-all bending length of 72 in. and model 285 an overall length of 96 in. Both have 25-ton capacity. Model 135 has a 15-ton capacity for bending 30 in. of 12 ga to 48 in. of 16 ga mild steel.

New hydraulic press brakes are offered in 42 standard sizes from 100 to 1000 ton capacity. Features include variable-delivery "Oilgear" pumps, compact panel with low voltage control, and zero positioning — *Dreis & Krump Mfg. Co., 7400 S. Loomis Blvd., Chicago 36.*

Manual Welding Kit For Plastic Material

WELDING KIT for maintenance and repair of plastic products contains a plastics welder, an aluminum welder stand, a round welding tip, a tack welding tip and a 16 ft neoprene air hose with an electrical three-wire cord. Also included are an instruction manual and descriptive

bulletin. The steel carrying case measures 16 x 7 x 7½ in. — *Kamweld Products Co., 932 R Washington St., Norwood, Mass.*

Printed Duct Labels With Adhesive Backs

"DUCTAGS" identify specific ducts for every room in a house and indicate damper positions. Backed with permanent adhesive, the labels are printed with the name of each room, contain directional locations, and use markers to indicate damper positions. A large label provides space for the dealer-contractor to stamp his name, address and phone number. — *Arkton Products Co., P. O. Box 3501, Cleveland 18.*

Furnace Has Four Blower Speeds

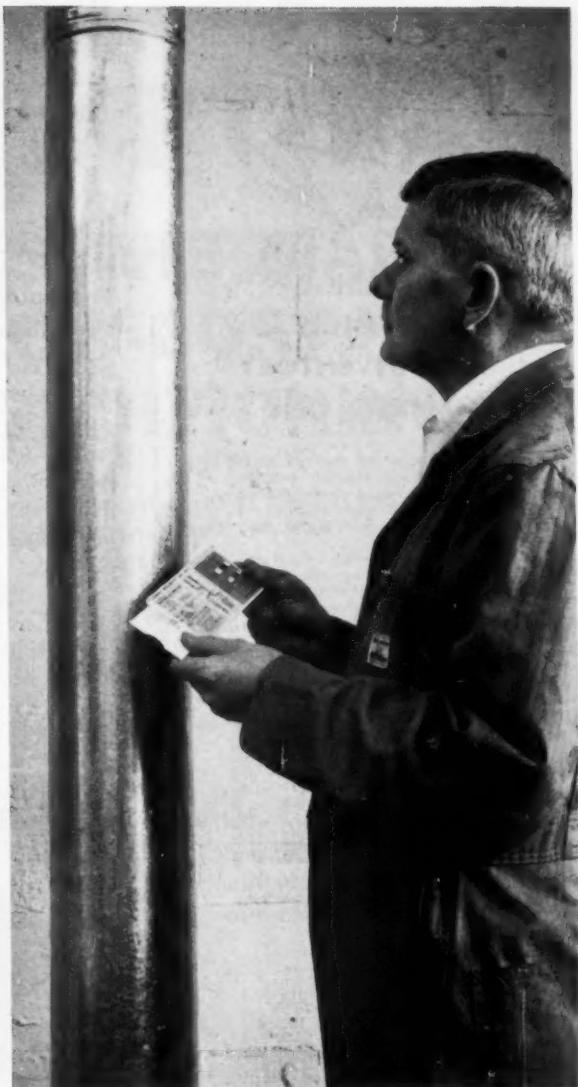
COMPACT, GAS-FIRED counterflow furnaces are 51 in. tall, 26 in. deep, and vary from 16 3/16 to 20 3/16 in. in width. Three models of 80,000, 100,000 and 120,000 Btu/h output have a direct drive blower powered by a permanent split capacitor motor which permits selection among four different blower speeds to vary air output. These models can be used with cooling coils for year-round air conditioning. Three other models of the same heating capacities use a shaded pole blower motor with a selection of three speeds to vary air output to house requirements — *Carrier Air Conditioning Co., Div. of Carrier Corp., Carrier Parkway, Syracuse 1, N. Y.*

Portable Spot Welders For On-the-Job Use

PORTABLE, RESISTANCE type spot welder features a built-in timer with adjustments from 1/60 second to a full second. Capacity is 3/16 in. for cold rolled steel and up to 1/8 in. combined thickness for stainless, galvanized and cadmium plated steel, according to the company. In applications where portability is not desired, welder may be mounted on a tripod stand which offers the convenience of a foot pedal. Also available are "Roto" holders,

Other Departments

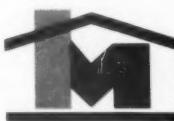
- New Trade Literature 73
- We Hear That 75
- Wholesaler Doings 77
- Appointments 78



IN THE OFFICE... ON THE JOB THIS MAN HAS THE LATEST GUIDES TO PROFITABLE VENTING



The dealer who installs Metalbestos is number one again in '61. Why? Because only he is backed by the latest information for dependable venting in a minimum of manhours. There's the new Metalbestos Gas Vent Tables and Handbook, the most complete guide to designing Type B systems 3" thru 24". And it's his *exclusively!* There's the Metalbestos Calculator for on-the-spot sizing... for fast, accurate bids that save precious minutes on the job. Any wonder why the dealer who specifies Metalbestos is number one! Your nearby Metalbestos Distributor can give you all the details.



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WILLIAM WALLACE COMPANY
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Residential Furnace Models



Residential Portable Models

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Industrial Duct Types



Industrial Space Types



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Chicago Office: 548 W. Washington Blvd.

Please send FREE information on Walton's program for building humidification sales plus the name of the nearest Walton Distributor.

Distributor Inquiries Welcome.

| |
|------------------------|
| Name _____ |
| Company _____ |
| Position _____ |
| Address _____ |
| City _____ State _____ |

equipment developments

(Continued)

which permit welder to be used in any position — *Ace-Sycamore, Inc.*, 447 DeKalb Ave., Sycamore, Ill.

Hydraulically Operated Portable Power Punch

No. 700-T-1/2 hydraulic power unit for use with portable punches has two-stage pumping system for rapid approach and slow down for work stroke. New design insures no loss of operating pressure during prolonged punching operations, according to the company. Heavy duty contactors control motor direction with use of pushbuttons. Pushbutton enclosure can be mounted on punch or used as pendant station. Foot switches are also available. Unit weighs approximately 59 lb with oil, is 16 1/2 in. long — *W. A. Whitney Mfg. Co.*, 636 Race St., Rockford, Ill.

Truck Mounted Vacuum Features "Hi/Lo" Action

"ROCKET POWER-VAC" truck mounted vacuum cleaner for residential and commercial coal, oil and gas furnaces features "Hi/Lo" power suction action designed to remove all dust, soot, rust and scale. Unit may also be used for cleaning duct systems, chimneys and incinerators. Equipment is available on a lease basis — *Fuller Furnace & Chimney Cleaning Corp.*, 700 Southern Blvd. Bronx 55, N.Y.

Baseboard Diffuser Features Snap-lock

"SPREDAIRE" BASEBOARD diffuser for heating and cooling applications features snap-lock construction which eliminates need for screws in installation. Base section is secured to the wall and floor, and tabs hold register boot

in place. Damper section is then hooked under the top of the base section, pressed into position, and snap-locked to the bottom of the base section. Free area is 36 sq in., according to the manufacturer. Knockouts in the base permit use with 12 in. x 2 1/4 in. and 14 in. x 2 1/4 in. register boots — *Excelsior Steel Furnace Co.*, 546 W. Washington Blvd. Chicago 6.

Thread Cutting Screws To Withstand Vibration

METAL SCREWS have been expanded to include Types 1, 23 and 25 thread cutting screws. The cutting edge and chip cavity in the tapered entering threads of screws allow removal of material to form a close-fitting mating thread. They require a minimum driving torque and withstand loosening caused by vibration and temperature variations, according to the company. Screws are available in all standard sizes, head styles and finishes — *Southern Screw Co.*, P. O. Box 1360, Statesville, N.C.

Blind Rivet Kit for Installing Insulation

ADVANTAGES CLAIMED for "Klip Kit" method of fastening insulation to large size air conditioning ducts include saving of time, cutting of material costs, and insurance against the possibility of loose insulation clogging the ducts. The kit contains 650 specially designed long mandrel "Pop" rivets that are inserted and set from the same side of the work. The rivets differ from regular "Pop" rivets in that the mandrel does not break after the rivet has been set. Also included in the kit are "Insul-Klip" metal plates engineered to spread the grip strength of the rivets over a wide area of insulation — *Fastener Div., United Shoe Machinery Corp.*, Route 110, Shelton, Conn.

NEW GM-DELCO THRIFT-PAK

OPENS THE MARKET FOR LOW-COST HOME CONDITIONING

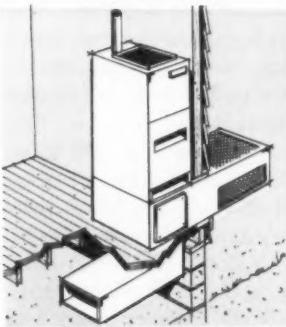


GM-Delco's new thru-the-wall heating and cooling system now brings the vast \$10,000 to \$15,000 range of homes into the air conditioning market. In fact, *Thrift-Pak* was specifically designed to make it practical to install year-round air conditioning in these modestly priced homes. Low installation cost makes this possible. In just sixty minutes, two men can install this new GM-Delco Conditionair. For more information, write the Delco Appliance Division, Dept. O-7, General Motors Corporation, Rochester 1, New York.

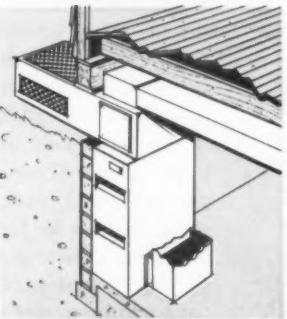
THRIFT-PAK
(upflow or counterflow models)
gives complete heating and
air conditioning

Versatile - 4 practical applications

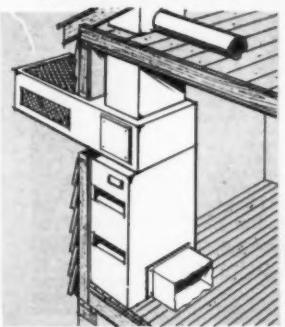
CRAWL SPACE



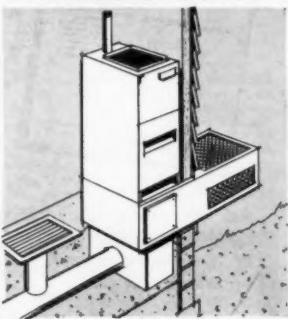
BASEMENT



OVERHEAD DUCTS



SLAB CONSTRUCTION



GM Delco 365 CONDITIONAIR

DELCO APPLIANCE DIVISION • GENERAL MOTORS CORPORATION • ROCHESTER, NEW YORK

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L-28 ECONOMY FLOOR DIFFUSER



YOU CAN HAVE "ROCK-BOTTOM" ECONOMY with our L-28 "Bid-Maker" FLOOR DIFFUSER . . . the kind of economy today's low-priced housing market demands in order to be competitive. **YOU SAVE ON MATERIAL** because the L-28 costs you less than comparable diffusers.

YOU SAVE TIME because no tools are required for installation. Anyone can place the L-28 over the opening and the job is done . . . no screws or nails are necessary.

YOU OFFER QUALITY all down the line with features that are usually found only in floor diffusers priced considerably higher. Features like free-moving dial damper control, adjustable damper opening stop. The fins of the L-28 are constructed on 1/3 inch centers for minimum "see-through", greater safety and a more attractive appearance. The fins are preset at the factory but can be quickly adjusted on the spot to deliver any air-flow pattern desired.

Why pay more . . . Why offer less?



**SIZES
AVAILABLE**
2 1/4 x 10
2 1/4 x 12
2 1/4 x 14
4 x 10
4 x 12
4 x 14

**FINISHES
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equipment developments

(Continued)

Automatic Decoiling, Cut-to-Length Machine for Sheet Widths to 72 in.

AUTOMATIC DECOILING and cut-to-length line was designed to provide accurate cut lengths at a low initial cost. According to the company, the new line offers numerous ways for users of mild cold rolled steel sheet to save money. For example, coil stock is lower in cost. There is less scrap loss, lower labor cost, lower inventory, handling and storage cost.

The basic line consists of a coil reel, a straightener or leveler-measuring unit, a hump table, a shear and a conveyor unit. Various capacity lines are available, with a maximum sheet thickness of 3/16 in. and 72 in. width. Cut length accuracy of plus or minus 0.008 in. can be provided depending on customer's requirements, the company states. Optional equipment such as coil ramp, coil lift, peeler (for heavier gage materials), tracking device, edge trimmer, scrap chopper and stacking unit is available.

The line has a centralized control system which includes a control console, auxiliary electrical control cabinets, variable speed drive units, inter-connecting wiring, terminal boxes, conduit and related equipment. All wires are numbered and mounted to terminal strips to facilitate disassembly and re-assembly — *Lennox Tool & Machine Builders, Dept. 360, Lima, O.*

Gas Heating Valve to Modulate, Sense Temperature Change

"ADATROL" VALVE for low capacity central gas heating systems offers a combination of four inlets and outlets for any piping installation. All connections and adjustments are located on top of the valve to allow easier operating and servicing. These include the gas cock knob, pilot adjustment screw, thermocouple connection, pressure regulator adjustment and thermostat knob (or wiring connection when a wall thermostat is used).

The basic unit includes a gas cock and safety pilot section. To provide for automatic heating, three different types of thermostatically controlled operators can be factory or field mounted on the basic unit. These are: 1) Two-position thermostat operator which uses a liquid filled bulb to sense temperature changes; 2) "Modusnap" thermostat which also uses a bulb, but is said to give the added advantage of modulated heating; and 3) a 24-volt heat-motor operator which is used with a wall thermostat for more precise control of room temperature — *Minneapolis-Honeywell Regulator Co., 2747 Fourth Ave., S., Minneapolis 8.*

equipment developments

(Continued)

Furnace Line Extended to 20 Oil-Fired and 37 Gas-fired Models

REDESIGNED AND EXPANDED oil-fired furnace line includes 20 models ranging in capacity from 65,000 to 250,000 Btu/h. Four types are being produced — lowboy, low-highboy, counterflow and horizontal. Horizontal furnaces feature a new heat exchanger and combustion chamber, which were introduced to facilitate the addition of air conditioning units and improve air flow.

The company has also restyled its gas-fired furnaces for 1962 and will offer a total of 37 models in capacities from 55,000 to 275,000 Btu/h. Available in lowboy, low-highboy, counterflow and horizontal models, the furnaces have a new step-opening gas valve designed to eliminate startup and shutdown noise; a smaller, round flue connection; and knockout panels located on both sides and the base for easy return air connections.

A new central system air conditioner designated the "1140" is a 33,000 Btu/h unit. It contains an evaporator, condensing coils and compressor. Air will be circulated through the conditioned space by the furnace fan.

Also new is a packaged heat pump tailored to southern climatic requirements. Unit has a 26,000 Btu heating and cooling capacity.

Two new electric furnaces are designed for residential and small commercial installations. Model 4933 has a 33,000 Btu capacity, model 4966 a 66,000 Btu capacity. Both are designed for horizontal, vertical and counterflow operation — *Airtemp Div., Chrysler Corp., 1600 Webster St., Dayton 4.*

Two Oxy-acetylene Packages Provide Light and Medium Welding

TWO OXY-ACETYLENE welding and cutting packages contain apparatus guaranteed for one year against defects in materials and workmanship. The light-duty "One Hundred" kit features a "Purox W-200" welding torch and CW-200 cutting attachment. Three welding heads for welding metal up to 3/8 in. thick and a cutting nozzle for slicing 2 in. steel are also supplied. Small oxygen and acetylene regulators are included. The medium-range "One Thirty" outfit includes a "Purox W-201" welding torch, three welding heads for welding up to 3/8 in. and a CW-202 cutting attachment with a nozzle which will cut up to 4 in. Single-stage oxygen and acetylene regulators are also included. Both kits contain 12½ ft of oxygen and acetylene hose, friction lighter, goggles and complete operating instructions — *Linde Co., Div. of Union Carbide Corp., 270 Park Ave., New York 17.*

Skuttle's

NEW improved

MODEL 900 CORMAIRE



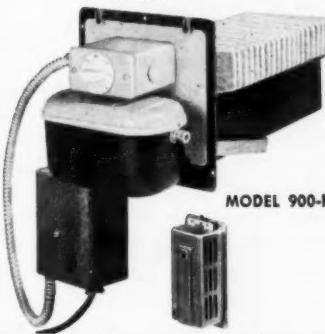
FREE HYGROMETER

This precision instrument to measure the amount of relative humidity in the air is furnished free with every Model 900 Cormaire humidifier.

3 TYPES OF CONTROLS

Complete with 20 Vapoglas plates, the output capacity of the Model 900 when used as a Vapoglas plate humidifier usually provides adequate humidity in the late spring and early fall. When a drastic drop in temperature occurs, the output of the "Cormaire" can be increased by simply setting the dial that controls the electric heating element. The dial, or cycling switch, is standard equipment on the Skuttle Model 900 "Cormaire." If complete automatic humidification

- completely enclosed heating element
- single pivot valve
- one piece cycling switch control



is desired, a relay transformer and humidistat is standard equipment on the Model 900-H. The humidistat can be placed in any convenient location in the home or office, and can be set for any desired percentage of relative humidity. The Skuttle "Cormaire" will then automatically switch off or on to maintain the reading on the humidistat.

Skuttle

MANUFACTURING CO., Milford, Michigan
DEPT. AA

Gentlemen:
Please send prices and complete information on Skuttle Models 900 and 900-H Humidifiers to:

Name _____

Company _____

Address _____

City _____ State _____

WITH THE ASSOCIATIONS

Continued from page 56

Coming Events

(Additional Listings on Page 68)

January

Jan. 22-23 — National Warm Air Heating and Air Conditioning Association, Dealer Conference, Region 1. Somerset Hotel, Boston. James M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

Jan. 25-26 — National Warm Air Heating and Air Conditioning Association, Dealer Conference, Region 2. Penn Sherwood Hotel, Philadelphia. James M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

Jan. 29-31 — American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., semi-annual meeting. Chase Park Plaza, St. Louis. R. C. Cross, executive secretary, United Engineering Center, 345 E. 47th St., New York 17.

Jan. 31-Feb. 3 — West Virginia University college short course. West Virginia University, Adult Education Division, Morgantown, W. Va.

February

Feb. 4-7 — New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, annual convention. Manger Hotel, Rochester, N. Y. Clarence J. Meyer, executive secretary, 569 Genesee St., Buffalo.

Feb. 5-8 — Oklahoma State University college short course. Oklahoma State University, Adult Education Division, Stillwater, Okla.

Feb. 12-15 — 12th Exposition of the Air-Conditioning, Heating and Refrigeration Industry. Great Western Exhibit Center, Los Angeles. George E. Mills, show di-

rector, Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N. W., Washington 6, D.C.

Feb. 12-15 — Refrigeration and Air Conditioning Contractors Association, annual convention. Biltmore Hotel, Los Angeles. Joseph L. Koach, executive director, 20 N. Wacker Dr., Suite 2265, Chicago 6.

Feb. 15-16 — National Warm Air Heating and Air Conditioning Association, Dealer Conference, Region 11. Hotel Mayfair, Los Angeles. James M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

Feb. 19-20 — National Warm Air Heating and Air Conditioning Association, Dealer Conference, Region 10. Sheraton-Palace Hotel, San Francisco. James M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

Feb. 19-22 — Annual Industrial Ventilation Conference. Kellogg Center, Michigan State University, East Lansing, Mich. James C. Barrett, Michigan Department of Health, Lansing 4, Mich.

Feb. 22-23 — Ohio Sheet Metal Contractors' Association, annual convention. Biltmore Hotel, Dayton, Ohio. William E. Favret, president, 55 Goodale, Columbus.

Feb. 22-23 — National Warm Air Heating and Air Conditioning Association, Dealer Conference, Region 9. Utah Hotel Motor Lodge, Salt Lake City. James M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

Feb. 23-24 — Sheet Metal and Roofing Contractors' Association of Minnesota, annual convention. Spalding Hotel, Duluth, Minn. Howard D. Camitsch, executive secretary, 867 Grand Ave., St. Paul.

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—*in conjunction with 40th Annual Oil Heat Industry Convention (which includes 5 days of big dealer sessions)*

Apr. 9-12, 1962-Conrad Hilton Hotel, Chicago

If you want to sell the dealers, jobbers and distributors who account for the bulk of the nation's business in oil heating equipment, accessories and heating oils... if you want to sell the manufacturers and refiners... here is the place to exhibit. This biennial high point in the heating industry will take place at a time when Oil Heat is taking giant steps forward—with a new, vital all-industry organization—with new research—with new programs—with a new future.

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equipment developments

(Continued)

Commercial Humidifier Uses Plastic Housing

MODEL 118 "Aprilaire" commercial humidifier may be installed on furnace plenum or mounted on a horizontal duct. Water is evaporated from a water panel so that moisture is introduced as a vapor, and mineral deposits are either trapped by the panel or washed down the drain. This is said to eliminate maintenance problems caused by liming of working parts. Control is by humidistat, which activates the unit when required, and shuts it off when the humidity setting has been reached.

To avoid the possibility of rust and corrosion, the company states that it now uses plastic components and housings for "Aprilaire" humidifiers — Research Products Corp., 1015 E. Washington Ave., Madison 1, Wis.

Baseboard Diffuser Offers 13 ft Spread

BASEBOARD DIFFUSER, only 15 in. wide, has an available 38 sq in. of free area, according to the company. Adjustable fins are preset to blanket up to 13 ft of wall with a wide, fan-shaped pattern. Diffuser face can be easily removed and replaced at any time. Damper opening can be limited by an adjustable stop — Air Control Products, Inc., Coopersville, Mich.

Six Tubing Benders Ease Installation Work

SIX SIZES of tubing benders are recommended for use with soft or hard copper, aluminum, certain sizes of stainless steel tubing, and brass tubing. The six benders will accommodate tubing of 3/16 in., 1/4 in., 5/16 in., 3/8



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Service Center...*

60-INCH WIDE CONTINUOUS ROLLED STAINLESS STEEL

World's largest producer of stainless and alloy steels, Republic is the *only producer* of continuous rolled stainless sheet up to 60 inches wide. Continuous rolling provides a more uniform sheet with a better finish. Stainless is available in coils in 1, 2-B, and 2-D finishes, and in 3, 4, 6, 7, and 8 finishes in cut lengths. Republic produces 45 standard types of stainless — has tailored other special grades to meet specific requirements.



WITH THE ASSOCIATIONS

Continued from page 66

Coming Events

Continued from page 66

February

Feb. 26-Mar. 1 — Iowa State University college short course. Iowa State University, Adult Education Division, Ames, Iowa.

March

Mar. 5-7 — Sheet Metal Contractors' Association of Wisconsin, annual convention. Hotel Schroeder, Milwaukee. Robert S. Schmieder, executive secretary, 8320 W. Bluemound Rd., Milwaukee.

Mar. 5-8 — North Carolina State College short course. North Carolina State College, Adult Education Division, Raleigh, N. C.

Mar. 12-15 — Purdue University college short course. Purdue University, Adult Education Division, Lafayette, Ind.

Mar. 19-22 — Annual Industrial Ventilation Conference. North Carolina State College of Agriculture and Engineering, Raleigh, N. C. Motte V. Griffith Jr., College Extension Division, P. O. Box 5125, Raleigh, N. C.

Mar. 20-23 — University of Wisconsin college short course. University of Wisconsin, Adult Education Division, Madison, Wis.

Mar. 21-24 — Pennsylvania State University college short course. Pennsylvania State University, Adult Education Division, McKeesport Campus, McKeesport, Pa.

Mar. 22-23 — National Warm Air Heating and Air Conditioning Association, Dealer Conference, Region 7. Sheraton-Dallas Hotel, Dallas. James M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

April

Apr. 8-12 — National Oil Fuel Institute, Inc., annual convention and exposition. Conrad Hilton Hotel, Chicago. Charles H. Burkhardt, managing director, Equipment-Technical Div., 60 E. 42nd St., New York 17.

Apr. 12-14 — Roofing & Sheet Metal Contractors Association of Florida, annual convention. Robert Meyer Hotel, Jacksonville. F. D. Wesley, managing director, P. O. Box 1044, Lakeland, Fla.

Apr. 26-27 — Sheet Metal Contractors Association of Illinois, annual convention. Abraham Lincoln Hotel, Springfield, Ill. Lou Reining, convention chairman, 4957 W. Diversey Ave., Chicago 39.

May

May 12-18 — Sheet Metal and Air Conditioning Contractors' National Association, annual convention. On board the "Queen of Bermuda" en route to Bermuda. Leaves from New York City Saturday afternoon, May 12. J. D. Wilder, executive secretary, 107 Center St., Elgin, Ill.

May 20-22 — Northamerican Heating & Airconditioning Wholesalers, Inc., spring meeting. Jack Tar Hotel, San Francisco. Wilbur R. Bull, executive director, 1200 W. Fifth Ave., Columbus 12, Ohio.

June 14-16 — Sheet Metal, Roofing, Heating, Air Conditioning Contractors' Association of Georgia, annual convention. Riverside Hotel, Gatlinburg, Tenn. B. L. Noblitt, executive secretary, 208 Red Rock Bldg., Atlanta, Ga.

equipment developments

(Continued)

in., 7/16 in. and 1/2 in. outside diameter. Benders are said to be specially designed for easy application and removal when working with tubing which is already installed or where access is difficult. Calibration marks on the forming rolls are graduated in 45 deg angles to facilitate bends of any angle up to 180 deg — *The Ridge Tool Co., Elyria, O.*

Five-in-One Hammer By Interchanging Heads

"SHURE-DRIVE" HAMMER uses five interchangeable tips of varying degrees of hardness. Tips are made of plastic and are secured in steel collars. They are colored to conform with federal specifications of durometer hardness — *Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., 289 Winchester Ave., New Haven 4, Conn.*

Commercial Heater Features Three Models

GAS, OIL OR gas-oil heating units for commercial applications range in capacity from 200,000 to 2,000,000 Btu/h. Units are available in highboy, counterflow and horizontal models, are said to be readily adaptable to year-round air conditioning. Features include high capacity twin blowers and welded stainless steel primary heating surfaces — *Campbell Heating Co., 3121 Dean Ave., Des Moines 17, Iowa*

Roof Exhauster Has Low Lineal Design

"LINEA" CENTRIFUGAL and axial flow roof exhausters feature low linear design to blend in unobtrusively with building lines. Housings of extruded aluminum are corrosion-resistant, are de-

signed to offer years of service with a minimum of maintenance. Features include air cooled motors, heavy gage extruded louvers with a reinforced lip for extra rigidity, and roof and curb cap fabricated of 12 ga aluminum — *Penn Ventilator Co., Inc., Goodman above Allegheny Ave., Philadelphia 40.*

Heating-Cooling Unit Line Redesigned

LOWBOY, HIGHBOY, counterflow and horizontal models are included in Series J gas and oil fired furnaces. All models are available as complete year 'round air conditioners with cooling capacities ranging from 2 to 7 tons. Other new equipment includes commercial air conditioners in capacities from 7½ to 20 tons and gas-fired unit heaters ranging from 65,000 to 300,000 Btu/h — *The Meyer Furnace Co., 1300 S. Washington St., Peoria 1, Ill.*

Flexible Air Duct Meets Code Requirements

FLEXIBLE AIR duct with 14 in. inside diameter is available in three types — No. 57, for general air conditioning use; No. 52, for use in New York City; and No. 5J, designed to meet Chicago requirements. Duct is supplied in 15 ft lengths — *The Wiremold Co., Hartford 10, Conn.*

Square Drive Service Wrench for Valves

RATCHET WRENCH features an oil-resistant neoprene rubber plug which actuates and holds the pawl in position. Wrench has total of only seven parts. According to the company, it can be field stripped with a pocket knife and easily re-assembled. It is available in 1/4, 3/8, 1/2 and 3/4 in. square drive models — *Crescent Tool Co., 230 Harrison St., Jamestown, N.Y.*



Strong, Modern, Dependable

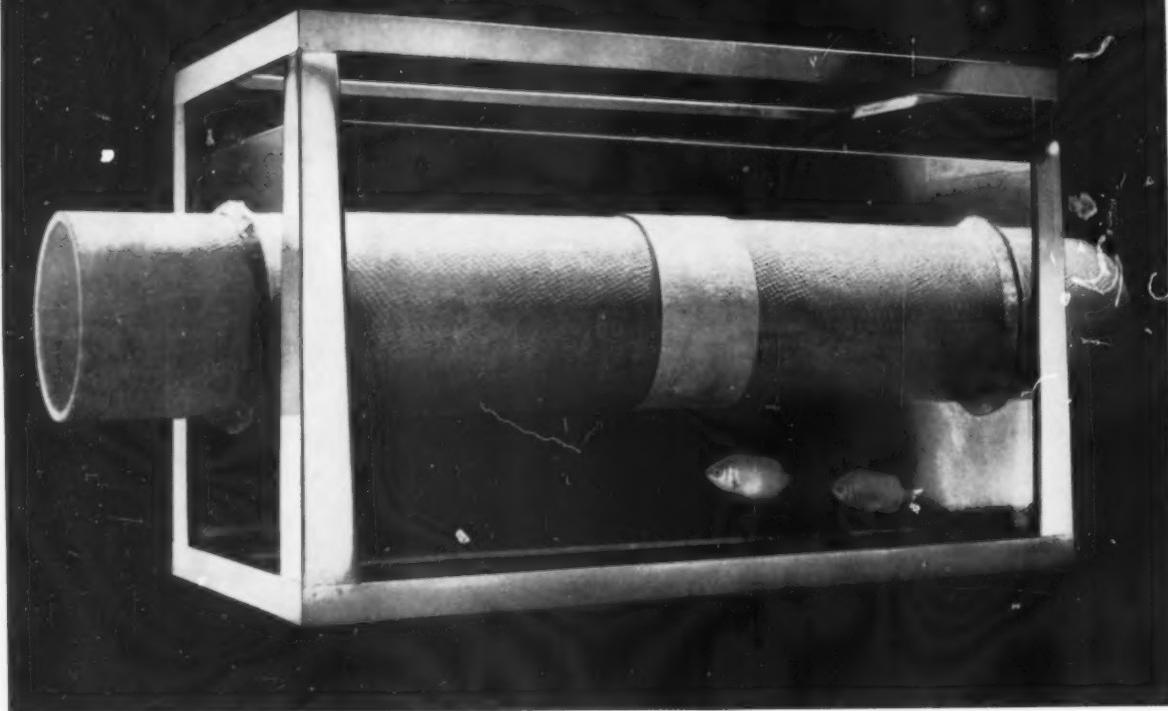
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THE RIGHT STAINLESS STEEL TYPE AND FINISH

Difficult application? Ask your distributor about Republic's unique stainless steel metallurgical service. Mill, field, and laboratory metallurgists investigate the application, then recommend the most economical type, finish, and fabricating method capable of meeting your requirements. Republic has the largest staff of field metallurgists in the industry.



DESIGNED TO MEET REVISED F.H.A. REQUIREMENTS



New J-M Ductite® Coupling assures water-tight air duct joints

SLAB-ON-GROUND HEATING-COOLING DUCT SYSTEMS must have water-tight joints when the bottom of the ductwork, adjacent to the perimeter of the slab, is below exterior finish grade. Johns-Manville's new Ductite Coupling, for use with Transite® Air Duct, is designed to meet all these revised F.H.A. requirements as described in F.H.A.'s MPS General Revision No. 3 and Materials Release No. 44b.

The Ductite Coupling is an inorganic product which utilizes asbestos bonded with a water-proofing compound. It makes a strong, tight joint which seals itself to the Transite Ducts and fittings it connects.

Extensive laboratory tests on this new coupling have proved it *100% water-tight*. Alternating wetting-drying cycle tests have established Ductite's superior performance under simulated service conditions. And, for over two years, this new coupling was tested in actual service. Here, it also proved to be resistant to corrosion, fungi and termites.

For full details on the Ductite Coupling for Transite Air Duct, write to Johns-Manville, Box 362, AA-12, New York 16, N. Y. In Canada: Port Credit, Ontario. Cable: Johnmanvil.



JOHNS-MANVILLE
TRANSITE AIR DUCT



equipment developments

(Continued)

Replacement Simplified With Filter-Grille

FILTER-GRILLE combination is designed for use with return air systems connected to heating and cooling equipment located in attics or crawlspaces. The return air grille has a full length piano hinge to permit the grille face to swing out from the frame, which contains a 1 in. throwaway filter. Grille capacities range from 550 to 2000 cfm. One-piece curved louvers (set at 30 deg deflection) provide maximum free area and conceal the filter from view — Lima Register Co., 1790 N. Cable Rd., Lima, O.

Heat Pumps for Offices, Stores

REMOTE AIR TO air heat pump is designed to provide year 'round

air conditioning for a small store or office area. Installed in multiples, units can provide year 'round air conditioning for larger areas. Supplemental heating equipment is optional — Heat Controller, Inc., Losey at Wellworth, Jackson, Mich.

Humidifier Incorporates Electric Heating Element

MODEL 900 "CORMAIRE" humidifier uses an electric heating element as well as evaporating plates. As a plate humidifier, the company states, Model 900 usually provides adequate humidity in the spring and fall in sections where the outdoor relative humidity is high. As a controlled humidifier, the unit's output can be increased by setting the one-piece cycling switch that controls the electric heating element. To provide for automatic humidification, a relay transformer and humidistat are added — Skuttle Mfg. Co., Milford, Mich.

Chicago's New Bidding Plan

(Continued from page 50)

Nationwide introduction of the new Chicago plan was made at a panel discussion in mid-November to a capacity crowd of 560. Additional requests for tickets by more than 100 persons had to be turned down because there were no facilities to accommodate them. Out-of-town guests came from points as far away as Baltimore on the east coast and Los Angeles on the west coast.

Panelists represented each of the five major services involved in the conception and completion of a building. Representing the mechanical specialty contractors was W. A. Kuechenberg, R. B. Hayward Co. John Dolio, John Dolio & Associates, presented the consulting engineers' viewpoint. General contractors had E. H.

Marhoefer Jr., E. H. Marhoefer Jr. Co., express their approval of the plan. Edward Matthei, Perkins & Will, described an architect's objectives and told how the Chicago plan would help meet them. Building owners were represented by J. C. Sanderson, director of plant properties, Northwestern University. Mr. Sanderson favored the plan because it helps to curtail the unethical practices of some bidders that ultimately cost the building owner much more than had been originally saved by accepting the lowest bid from unqualified contractors. Henry J. Couch, executive secretary, Coordinating Committee of Mechanical Specialty Contractors Associations of Chicago, was the moderator.



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Perth Amboy, New Jersey
Atlas Steel Supply Company
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Benedict Miller, Inc.
Lyndhurst, New Jersey
Fisher Bros. Steel Corp.
Englewood, New Jersey
International Corporation
Hillsdale, New Jersey
Miller Steel Company, Inc.
Hillsdale, New Jersey
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Reynolds Aluminum Supply Company
Birmingham, Alabama
Louisville Kentucky
Memphis, Tennessee
Nashville, Tennessee
J. M. Tull Metal & Supply Co., Inc.
Birmingham, Alabama
Hubbell Metals Inc.
Louisville Kentucky
Memphis, Tennessee
Williams and Company, Inc.
Louisville 3, Kentucky
Mid-State Steel, Inc.
Nashville, Tennessee
Siskin Steel and Supply Company, Inc.
Chattanooga, Tennessee
Vance Iron and Steel Company
Chattanooga, Tennessee

WEST SOUTH CENTRAL STATES

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Little Rock, Arkansas
Marsh Steel Corporation
Baton Rouge, Louisiana
E. M. Jorgenson Company
Tulsa 5, Oklahoma
Dallas 22, Texas
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E. M. Jorgenson Company
Denver, Colorado
Phoenix, Arizona
Marsh Steel Corporation
Denton 36, Colorado
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E. M. Jorgenson Company
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CANADA

Durmonton McCall and Co., Ltd.
Toronto, Ontario
Montreal, Quebec



REPUBLIC Stainless Steel
REPUBLIC STEEL • CLEVELAND 1, OHIO

Here are Answers to 12 A C Problems

(Continued from page 37)

lations. Thus, it might permit sequential starting of a three and a two horsepower motor on single phase service whereas it might not permit the use of a single phase five horsepower motor at all.

9. How Does Remote Unit Affect Operation?

The long refrigerant lines may be undersized or obstructed by a kink. The effect of excessive line pressure drop would not become evident until peak cooling loads were experienced.

10. How to Correct an Undersized Supply?

The installer must live up to his responsibility. He must either replace the undersized supply duct with a duct of the proper size or he must install a second duct to supplement the one that is too small. It is, of course, possible to add resistance to all the properly sized ducts to bring the system into balance and then speed up the fan to obtain the proper air flow. This is the procedure used to balance any system, but should be applied only to correct unpredictable unbalanced conditions and not to cover up an error. Such practice could lead to excessive fan power costs and objectionable noise.

11. How to Avoid Drafts?

Air flow from supply registers and diffusers is easily predictable from data in the catalogs of leading manufacturers. If care is taken in the selection and application of these, there will be little trouble.

Many times drafts are felt as air flows to return grilles. It is sometimes necessary to balance the return system so that excessive flow does not occur as it moves toward return openings that may be closest to the circulating fan.

12. Noise — How is it Minimized?

Tell him you always use flexible connections between equipment and duct work to prevent the transmission of direct vibration.

Tell him you always use a box discharge plenum properly sized and acoustically lined to keep most sound out the duct system.

Tell him you always include an acoustically lined elbow in return ducts which are short and close to the conditioner.

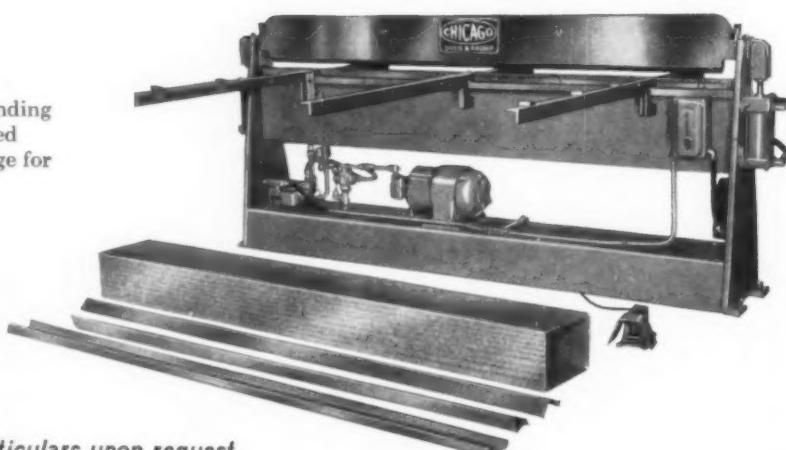
Tell him you are noise conscious and make conservative selections of duct sizes and air outlets to make sure sound levels will not be objectionable.

Show him some of your successful jobs.

Production Bending for duct sections and long, light-gauge work

CHICAGO® SPEED-BENDER

- 8 feet of 24-gauge or 5 feet of 20-gauge galvanized steel
- Adjustable front gauges; disappearing pin gauges for bending from notches; and spring-loaded gauge pins to make $\frac{1}{4}$ -inch edge for Pittsburgh lock
- Hydraulic operation
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- Two-position foot switch can be supplied for 90° bends and for shallow bends as in cross-braking



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new literature . . .

Presents Data Designed to Aid In Sizing Refrigerant Piping

"REFRIGERANT PIPING DATA" (62 pages, \$3) is designed to serve as a guide for the proper sizing of piping for the common types of refrigerants. Section I presents useful data for the proper sizing of Refrigerant 12 piping; Section II covers sizing of Refrigerant 22 piping. Purpose of the book, according to the publisher — Air-Conditioning and Refrigeration Institute — is not to set design standards, but to provide the latest pipe-sizing information available. It also discusses various factors which determine the allowable pressure drops in different portions of a refrigerant piping system.

Among the tables presented are: Suction Line Capacities-Tons; Discharge and Liquid Line Capacities-Tons; and Equivalent Lengths of Valves and Fittings. Charts present such data as velocity and pressure drop in copper tubing for Refrigerants 12 and 22, and pressure drop in valves and fittings. Sample problems together with step-by-step solutions show how to make use of tabular data—*Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N. W., Washington 6, D. C.*

Describes Features of Compact Gas-Fired Winter Air Conditioner

LITERATURE describes "Blue Comet" gas-fired winter air conditioner featuring a heat exchanger with a 10 year guarantee. Engineering data and specifications are presented in easy-to-read chart form. Units are completely assembled and wired at the factory—*Thatcher Furnace Co., Dept. 15P, Garwood, N.J.*

How Defense Contractors Are Required to Operate

BOOKLET explains in nontechnical language the manner in which defense contractors are required to operate under the mandatory rules of the Defense Materials System. Titled "The Defense Materials System and Priorities," the booklet replaces the pamphlet "The Defense Materials System in Our American Industry," published in 1955. Copies are priced at 25 cents.

The booklet is designed to explain why the Defense Materials System, under which priorities and allocations are administered, is necessary. It also describes the characteristics of the system. DMS governs operations by defense contractors engaged

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National Angle Rings can readily help you get the jump on time-consuming ring jobs. Because these rings are rolled accurately by experts, they are UNIFORM IN CURVATURE. This means that there is no lost motion, no costly fitting time required — in your shop or on the job site.

And because National leg out rings are available in stock for immediate shipment, you gain days of time by using this on-the-floor warehouse service. No inventory of your own is needed. Last, but by no means least, is National's price list. Production runs cut costs . . . allow National to quote you on stock prices rather than custom work. As it has so many others, it will pay you to investigate National today. Write for a stock ring bulletin and price list.

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new literature

(Continued)

in defense programs of the Department of Defense, the Atomic Energy Commission, the National Aeronautics and Space Administration, and the other defense agencies—Superintendent of Documents, Government Printing Office, Washington 25, D.C.

Gas-Fired Unit Heaters Feature Light Weight, Compact Design

SERIES NB centrifugal blower type gas-fired unit heaters are described in bulletin No. A-917 (four pages). Text explains operating and construction features. A keyed photograph illustrates components. Dimensional and performance data is included—American-Standard Industrial Div., Detroit 32.

Tells How to Reduce Duct Noise In Air Conditioning Systems

"SILENTFLOW" standard rectangular prefabricated duct silencers are described in bulletin B5 R3. Included are selection data, product photos and dimensional information—Silence Inc., P. O. Box 21, Farmingdale, N.Y.

Colored Aluminum Grilles Suitable For Interior, Exterior Applications

BROCHURE describes "Anotec" architectural aluminum grilles available in a wide range of standard and custom geometric patterns, dimensions and colors. Grilles are suitable for both exterior and interior use in new construction as well as modernization work, according to the company. Illustrations show various applications including ceilings, curtain walls, louvers, partitions, stair and parapet railings. Also being offered is a metal grating data and specification manual which illustrates patterns available, construction details, applications, etc.—Klemp Corp., 1132 W. Blackhawk St., Chicago 32.

Bulletin Tells How to Heat And Form Plastic Sheets

HEATING DEVICE designed to assure rapid and uniform heating of plastics in fabricating procedures is described in Bulletin 61-3. A section containing operating instructions explains how to make single, double and extra wide bends. Text is illustrated throughout with diagrams—Kamweld Products Co., 932 R Washington St., Norwood, Mass.

we hear that . . .

► CARRIER AIR CONDITIONING Co. launched its 1961-62 series of training courses for dealer-contractors and distributors with a three-week session on packaged equipment sales engineering held in Syracuse. A second class will run from January 22 to February 9.

The course covers both engineering and sales, beginning with a study of the fundamentals of air conditioning. Load estimating, equipment selection, air distribution and duct design for both residential and commercial applications are among the subjects treated. Also covered are sales fundamentals, from pre-sale planning and proposals to post-sale followup procedures. Discussions of product features and customer benefits are supplemented by visits to factory production lines.

A six-week course in application engineering is scheduled to begin January 8. This course will start with psychrometrics and analysis of the refrigeration cycle. Cooling loads will be estimated and selection procedures will be discussed. Lectures will cover controls, refrigerant piping, water piping, air distribution, duct design and electrical wiring.

Another educational program the company is sponsoring is designed to help builders sell their

houses. According to Frank Purcell, packaged equipment sales manager, the program will provide dealer-contractors with extra sales material in selling heating and air conditioning equipment to builders.

Instructors will use films and other materials to teach builders' salesmen how to size up prospective home buyers, determine their needs and emphasize the style of house and the features which are most likely to stimulate their desire to buy. The merchandising program will include pamphlets, brochures and other material specially tailored to the builder's project as well as news releases and a followup mail campaign designed to keep the buyer sold until the closing.

► RESEARCH PRODUCTS CORP. recently used television as a means of promoting "Aprilaire" automatic humidifiers to dealer-contractors. The program consisted of a half-hour sales meeting, during the course of which speakers discussed humidity, the reasons for artificial humidification, sales points of the humidifier and the benefits it provides to the buyer. An off-camera audience interrupted from time to time with pertinent questions. No attempt was made to direct the program to the general public — terminology, procedure and sales points were all slanted toward the dealer-contract-



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tor's interests. To promote the program, Research Products supplied distributors with special announcements of the meeting which the distributors were requested to send to heating dealer-contractors on their mailing lists. The dealers were invited to "attend our sales meeting and review the general subjects of humidity and humidification — without leaving the comfort of your favorite easy chair."

► THREE INDEPENDENT WHOLESALE distributing organizations in northern California, eastern Michigan and Texas are now handling residential furnaces, air conditioning equipment and heat pumps made by the Perfection Div., Hupp Corp., according to Carl W. Millsom, sales vice president. "Strong, independent wholesalers form the basis of our sales program," Mr. Millsom said. "Wholesalers such as those who have joined us offer not only local market knowledge but, more importantly, the valuable assets of trained engineering personnel and well-established branches throughout a trading area."

Joining Perfection as wholesalers are: Refrigerating & Power Specialties Co., San Francisco;

Semmler Wholesale Supply Co., Detroit; and Star Steel Supply Co., Houston.

► THE RYBOLT HEATER Co. has purchased the Niagara Furnace Div. of the Forest City Foundries Co.

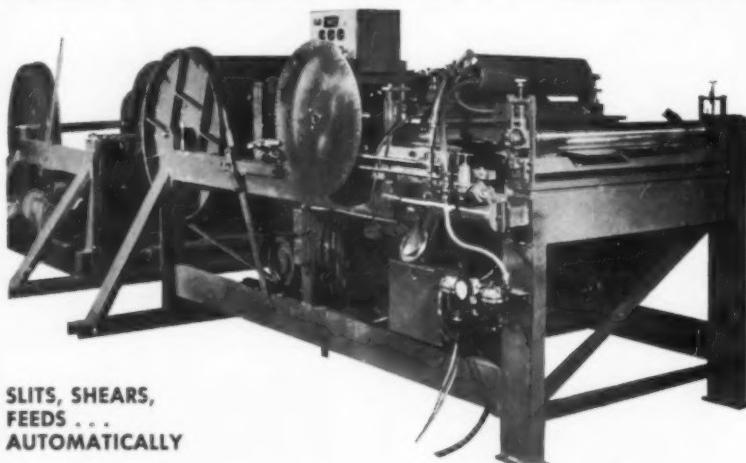
► MUELLER CLIMATROL, Div. of Worthington Corp., recently completed its cooling laboratories expansion program. The test rooms can simulate the climate of any area of the world where Mueller Climatrol cooling equipment is sold, according to the company. All test rooms have provision for automatic and continuous recordings of both wet and dry bulb temperatures, and air flow rates.

Total space of the laboratories has been increased from 3700 to 6000 sq ft. The company states that cooling capacity available for testing equals the air conditioning requirements of 15 average-size homes, and heating capacity for testing purposes would heat 11 average homes.

The testing facilities have been designed to accommodate up to 10-ton air conditioners and $7\frac{1}{2}$ ton heat pumps.

Provisions have also been made for testing and the development of electric furnaces and other electric climate control devices. A separate laboratory is maintained for the testing of oil and gas-fired furnaces.

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AUTOMATICALLY**

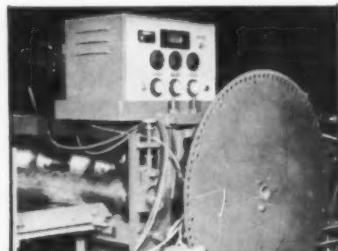
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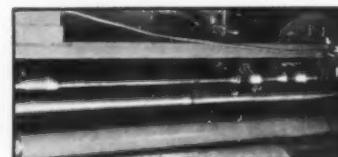
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Slitter slits metal. Unused metal is returned and rewound into a new roll of coiled metal.

wholesaler doings

► THE HARRY ALTER CO. has opened a new main office and warehouse building in Chicago. The new facility, providing over 65,000 sq ft of space, is located at 2399 Archer Ave. It includes parking accommodations for 50 cars.

The general offices — buying, accounting, executive, etc. — are set in the center of the building. Operating facilities — shipping, packing and receiving — occupy about 9000 sq ft. Six truck docks serve this department. A third area contains a 100 ft long counter for local customers and a large display space. Inventory is maintained in a 15,000 sq ft section. A surplus and bulk storage area covers over 30,000 sq ft.

Irving Alter, president of the company, says: "We believe this plant to be the world's largest distribution center exclusively devoted to refrigeration system supplies. The planning and carrying out of this project reflect not only our confidence in the general economy, but also our profound assurance regarding the future of the air conditioning and refrigeration industry."

► COMPACT COILS of steel or aluminum offer the contractor many advantages, according to the Souther Steel and Aluminum Co., St. Louis wholesaler. Benefits listed by the company include:

- 1) Material savings — through elimination of lap joints on roofing, valleys, etc.
- 2) Labor savings — through reduction in the number of joints to be made.
- 3) Convenience — the contractor can cut off material as needed from a coil on his truck.
- 4) Better quality job — because there are fewer joints to cause trouble.
- 5) Versatility and less waste — because the contractor can cut to exact length required.
- 6) Easier storage without damage.

To facilitate holding and unwinding of coils, the company offers "Coil Caddies" in two models, one a bench type, the other a free standing unit.

► THE GEORGE L. JOHNSTON CO., Detroit heating and air conditioning wholesaler, has sold its service division — the Johnston Refrigeration Service — to Dart Heating and Air Conditioning, Inc. The purchase by Dart includes all equipment, service trucks, stocks, service warranties and maintenance contracts. All administrative and service personnel of Johnston Refrigeration Service is now associated with Dart.

► THE DALE WEATHERMATIC CORP., 1700 - 8th Ave., S., Nashville, has been named Tennessee distributor for Bryant Mfg. Co. products.

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appointments . . .

► GARY FARRELL as a district representative for Milwaukee Electric Tool Corp. Serving north central Wisconsin and upper Michigan, he will make his headquarters in Green Bay, Wis. Rick Haise, who formerly covered this area, will devote his full time serving accounts in southern Wisconsin. He will work out of the factory in Milwaukee.

► BELCO DISTRIBUTORS, Somerville, Mass., as a distributor of residential and commercial humidification equipment for Walton Laboratories, Inc. Other new distributors in the eastern region are Bell Pump Service Co., Hartford, Conn., and Carleton Stuart, New York City. Added to the western region are A. T. Distributors, Memphis, Tenn., and Klein-Dickert, Madison, Wis. According to Herbert E. Puttbach, Walton sales manager, "These five companies — all principal distributors of heating, ventilating and air conditioning equipment in their respective areas — will provide complete sales promotion and engineering assistance to their dealers."

► THE SULLIVAN SALES CO., with offices and engineering services in Raleigh and Charlotte, N.C., as sales representatives for Welbilt Air Conditioning and Heating Corp. The Sullivan firm will cover both North and South Carolina. William Cass, 2208 N. E. 26th St., Oklahoma City, has been named to serve Oklahoma and part of Texas.

► SAM D. MULLIN as territorial sales supervisor for William W. Meyer & Sons, Inc., Skokie, Ill. Richard Friese, formerly district sales manager of Crown Stove Works, has also joined the Meyer company's staff. The Meyer firm is the Chicago area representative for General Blower Co., a subsidiary of Ilg Electric Ventilating Co. Neal B. Heaps has been named sales engineer for the Rainey Co., Houston, Tex., sales agency for General Blower.

► ROBERT P. McDERMOTT as district representative in the Long Island sales territory for the American-Standard Air Conditioning Div. He was previously associated with the Brooklyn Union Gas Co. as a representative handling the sale of gas-fired heating equipment.

► RAYMOND W. PUTERBAUGH as a sales representative for Inland Steel Products Co. Mr. Puterbaugh will cover parts of Ohio, Pennsylvania and West Virginia. He formerly represented the firm in Minnesota and the Dakotas.

appointments

(Continued)

► WALTER J. NICKEL as field application engineer for Mazingo's, Inc., Charlotte, N. C., dealer-contractor. Mr. Nickel will assist architects and builders in planning for warm air heating, air conditioning and air filtration systems for residential, commercial and institutional applications. He was formerly associated with the Hussman Refrigerator Co., St. Louis, as field service engineer, and at one time headed his own contracting business.

► HOWARD C. SHILLING as Chicago district sales representative for the Bridgeport Thermostat Div. of Robertshaw-Fulton Controls Co. He will serve a territory including northern Illinois, Wisconsin, Minnesota and parts of Indiana and Michigan. He was previously associated with the Barber-Colman Co. and Penn Controls Co.

Obituaries

C. D. Lyford

C. D. LYFORD, 64, a retired executive of Minneapolis-Honeywell Regulator Co., died November 1, 1961, in Minneapolis. He was a vice president of the firm at the time of his retirement in 1956. For several years he was in charge of gas control sales in the residential division, and he also directed the company's activities in the field of electric heating. Mr. Lyford had been associated with the home heating industry since 1919, when he joined Minneapolis Heat Regulator Co., one of the predecessor firms of the present Honeywell corporation.

Joseph A. Lattner

JOSEPH A. LATTNER, chairman of the board of Century Engineering Corp., died September 10, 1961 at the age of 88. Mr. Lattner is well known for his work in the development of residential oil burners. In 1923, as president of the P. M. Lattner Mfg. Co., he sponsored the development of the Lattner oil burner, which was nationally distributed by that firm. In 1926, he and his son, E. J. Lattner, organized the Century Engineering Corp. for the development and manufacture of one of the first gun type oil burners. Under his management, the Century firm expanded and diversified its line to include oil and gas furnaces as well as central air conditioning units.

Mr. Lattner was one of the early sponsors of the American Oil Burner Association. He was also an active member of the Oil-Heat Institute and served on various boards and committees of that organization.

Hard to
SODER —
Metals

Aluminum, Cast Iron
Stainless Steel
Galvanized Metals



Alfred Goethel Sheet Metal Works, Inc. HAS WHAT YOU NEED



Alfred Goethel Sheet Metal Works, Inc.
3218 W. Fond du Lac Ave., Milwaukee 10, Wis.



ORNAMENTS STAMPINGS & SPINNINGS

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW

89 ADAMS STREET

BROOKLYN, N.Y.

LITE-CAST COMBUSTION CHAMBERS QUICK HEAT LONG LIFE

MONOGRAM has . . .

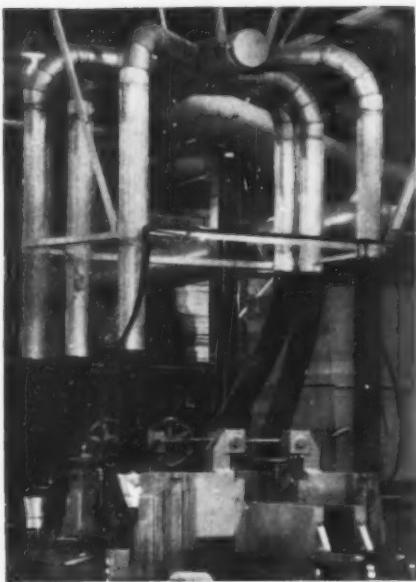
U.S. Pat. No. 2678488
371 Standard Designs and sizes of LITE-CAST Insulating Refractory Combustion Chambers for ALL Boilers and Furnaces.

- TONGUE & GROOVE JOINTS
- HIGH SIDE WALLS
- DOUBLE SEAL BETWEEN FLOOR & WALLS
- PRE-CAST FLOOR
- AIR SPACE BENEATH FLOOR

.75 TO 23 GALLONS PER HOUR

MONOGRAM PRODUCTS CO., INC.
733 NORTH 35TH STREET, PHILADELPHIA 4, PA.

YOU SAVE MORE WITH FLEXAUST[®] HOSE



Thousands of successful installations prove that use of Flexaust hose and Portovent retractable duct with metal duct systems lower installation costs — but there are other important advantages

- ✓ Exceptional abrasion resistance
- ✓ Corrosion resistance
- ✓ Noise absorption
- ✓ Durability under heavy flexing
- ✓ Provision for expansion and contraction
- ✓ Easy relocation of hoods and machines

Made of high quality neoprene coated fabrics 1 $\frac{1}{4}$ to 36" i.d.

Write today for full details
Distributors in all principal cities

THE FLEXAUST CO.

DEPT. AA 100 PARK AVE.
NEW YORK 17, N. Y.

HOW TO GET BETTER — FASTER MAIL DELIVERY

All any business concern needs to do is to cooperate in NIMS — NATIONAL IMPROVED MAIL SERVICE — a

cooperative program now underway and sponsored by the United States Post Office.

PRINCIPAL FEATURES:

- ✓ Encouraging large-volume mailers to schedule their mailings so they can be handled in the order of importance to them.
- ✓ Greater emphasis on pre-processing of mail in the mail rooms of large mailers.
- ✓ Continuing emphasis on "Mail Early in the Day" and other patron cooperation programs.

THE WAY TO THIS PROGRAM

The scheduling of mail — so that it moves in an orderly manner around the clock.

Under this cooperative program, big mailers would separate their priority mail from non-priority mail. The urgent business letters would go in one pile — and the remaining bulk of the firm's mail — bills, notices to stockholders, receipts, advertising material sent first class, etc. would go in the other. Then the much smaller piles of priority mail would be "worked" in the local post office and dispatched posthaste early the same evening.

Next morning, first thing, the remaining large quantities of non-priority mail will be worked at an uncluttered post office.

Although the non-priority mail actually will be withheld and deposited the next morning, the NIMS program will place priority mail "in line" in order of importance to sender and addressee, with resulting benefits of speedier delivery.

INVESTIGATE YOUR COMPANY'S MAILING PROCEDURES NOW. BY FOLLOWING NIMS YOU WILL BE CONTRIBUTING TO BETTER, FASTER MAIL SERVICE FOR ALL.

(This advertisement run in the interest of better postal service by)

AMERICAN ARTISAN
6 NORTH MICHIGAN AVENUE CHICAGO 2, ILLINOIS

Classified Advertising

Rates for classified advertising are 15 cents for each word, including heading and address. One inch \$7.00. Count nine words for keyed address. Minimum \$2.50. Closing date 20th of month preceding publication.

✓ SITUATIONS OPEN

SUPERINTENDENT for progressive sheet metal shop in Midwest. Give detailed account of experience, age, marital status, type of work, number of men supervised, size of shop, etc., in first letter. Address Key 1221, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

✓ AGENTS WANTED

REPRESENTATIVES WANTED — for top quality line of registers, grilles, diffusers, etc. Established manufacturer has a number of exclusive territories open. Unusually fine commission basis for manufacturers' agents calling on architects, engineers, contractors, etc. Please reply Key 1213, American Artisan, 6 N. Michigan Ave., Chicago 2, Illinois.

✓ BUSINESS OPPORTUNITY

FOR SALE — SHEET METAL CONTRACTING AND ROOFING CORPORATION — Wisconsin operation for 40 years. Volume \$400,000; surplus deficit; \$62,000 price without real estate. R/E available at \$24,500. Reason for sale offer — other business interests. Address Key 1230, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

FOR SALE — successful heating and plumbing business established. Selling for health reasons. Business is good and this is a real money-maker. In the heart of good hunting and fishing in Southern Idaho. Reply Key 1227, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

FIGHT TB WITH CHRISTMAS SEALS

ANSWER YOUR CHRISTMAS
SEAL LETTER TODAY



... move your products in greater volume
through consistent advertising in this

Service Section...

Rates for display space in the Service Section are \$14.00 per inch per insertion. One-inch minimum space accepted. Closing date — twentieth of the month preceding issue. Copy and layout service—no charge.



**Aluminum Power
Ventilators**

Send for catalog & prices
buy direct from manufacturer
Muckle Mfg. Co.
Owatonna 21, Minn.

AT YOUR WHOLESALER Today's Outstanding Automatic AIR CONDITIONING ACCESSORY

KESCO

Condensate Water

Disposal

PUMPS

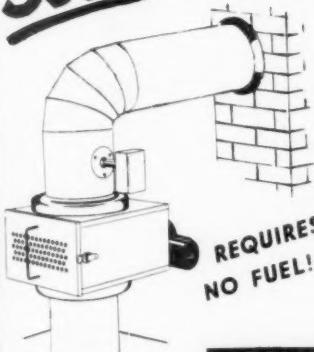
MANUFACTURED &
GUARANTEED BY
Kesco Products

EST. 1944

P.O. BOX 84, JAMAICA 13, N.Y.



SELL WASTE CHIMNEY HEAT



REQUIRES
NO FUEL!

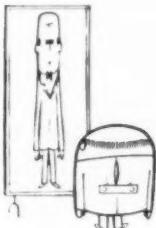
- Stak HEAT-RECLAIMER pays for itself by reclaiming only the heat now being wasted up the chimney — cuts regular fuel bills as much as 40%!
- Stak HEAT-RECLAIMER installs easily in the stack of oil or coal furnaces — no plumbing or radiators needed.
- SELL FREE-HEAT! Thousands now in daily use by cost-conscious home owners everywhere — every demonstration a sale.

TESTED AND APPROVED BY N.Y.
CITY BOARD OF STANDARDS &
APPEALS; STATE OF MAINE,
MASS., N.H. AND OTHERS.

**DOLIN METAL SALES CORP.
HEAT RECLAIMER MFG. DIV.**

323 LEXINGTON AVE., BKLYN. 16, N.Y. — NE 8-9474

SPECIAL MESSAGE FOR MANUFACTURERS



... why not do it with mirrors?

Unfortunately, it's not that simple. It takes a lot of hard work and expensive promotion to sell products these days, and in order to do the job properly ALL your prospective customers must be reached.

There's one sure way to assure complete and economical coverage and that's to use the American Artisan Service Section consistently. The Service Section represents a real buy when you consider you're reaching over 10,000 GUARANTEED readers each month at a cost of about $\frac{1}{8}$ c for each reader.

We'll help with the preparation of copy, too. Just send us literature and we'll supply a copy suggestion at no cost. If you decide to use space the charge is merely \$14.00 per column inch per month.

more information available

Your advertisement in this one column by one inch space costs only \$14.00 per issue — and we'll provide copy service.

phone, write, wire
AMERICAN ARTISAN

6 N. Michigan Ave.
Chicago 2, Illinois
Phone — STate 2-6916

Climb Safely

"All Rubber Ladder
Shoes"
Order Today
\$3.50 pair Postpaid
Johnson Ladder
Shoe Co.
Eau Claire, Wis.



THE NEW...THRIFTY 36 FLOOR MODEL GANG SLITTER

CUTS SHEETS TO A
FULL 38" WIDTH
AT A SPEED OF
60' FPM — 22 go. cap.

The THRIFTY 36 is equipped with four especially hardened knives which enable operator to make two cuts simultaneously. The two cold rolled gauges extend completely through the slitter for either right or left hand slitting.

Shipped completely assembled, ready to operate, equipped with 1/3 hp, 110 volt, 60 cycle gear-head motor.

TRADE PRICE—\$395.00 freight ppd.
For further details on cuts, speeds, and performance, write us today.



GARY STEEL PROD. CORP.
4400 WEST NINTH AVENUE
GARY 4, INDIANA



Time Tested for 25 Years
**Warm Air Boosters
and
Chimney Draft Fans**
Brumme Mfg. Co.
609 Freeman St.
Topeka, Kansas

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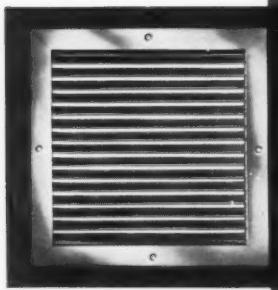
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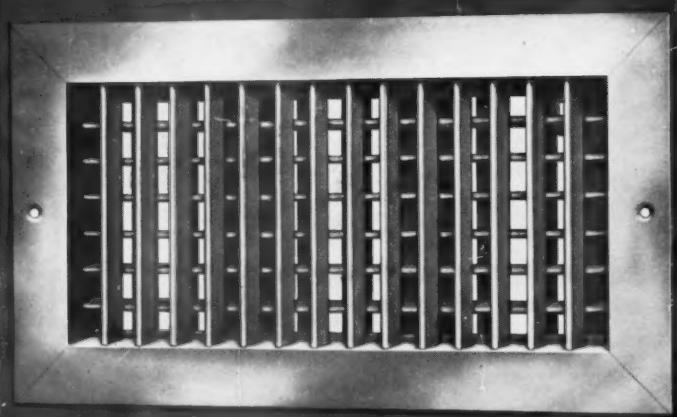


ROYALAIRe

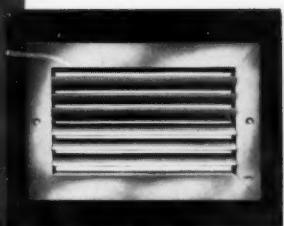
EXTRUDED ALUMINUM



No. RA-44 Return Air Grille



No. SG-14-V-OB:
Four-way deflection
register with opposed
louver volume control



No. CG-H-2: Double
Deflection Ceiling Grille

REGISTERS & GRILLES

for commercial and residential installations

are rapidly increasing in favor!



No. RA-NS
"NO-SIGHT"
Door Grille

. . . and all you have to do to realize why this is so is to actually see and inspect them. You'll be greatly impressed with the outstanding beauty of their acrylic coated satin finish which is impervious to rusting, pitting and corrosion even in salt air.* You'll like their extremely sturdy construction, entirely of aluminum extrusions which are far stronger than rolled aluminum and less susceptible to damage. And as far as functioning is concerned, you'll find that there just is nothing better. The line is complete. It offers the opportunity of achieving every desired direction of air flow and volume control for both domestic and commercial installations of every requirement.

By all means see the ROYALAIRe line at your H&C Jobbers without delay. You're bound to get "royal" results with it.

*Beautiful as this natural finish is, it still may be decorated without the necessity of a prime coat or danger of bleeding through.

**HART & COOLEY
MANUFACTURING CO.**

500 EAST EIGHTH ST., HOLLAND, MICHIGAN
IN CANADA: HART & COOLEY MANUFACTURING CO., FORT ERIE, ONTARIO

1-5





Because Century realizes you ultimately sell the equipment—

Century's Cooperative Advertising Program Promotes Your Ability and Reputation First

THIS CO-OP PLAN IS DIFFERENT!

A leading contractor magazine editorial recently stated: **"Who Sells The Stuff Anyway."**

"Most of the promotional material prepared for use in our industry suffers from one major defect which we think explains why it is not used more widely: Most of the copy is about the manufacturer, with very little space for the dealer's story.

"Recently, a co-op advertising program that runs counter to the general trend crossed our desk, and we hope there will be many more. In its new promotional package, Century Engineering provides mats in which 90 percent of the copy is devoted to the dealer, 10 percent to the product."

You are featured as the best qualified, most dependable heating and air-conditioning contractor in your community . . . even when Century pays half the space cost.

Century ad mats, radio scripts, direct mail, and literature naturally devote some space to the outstanding features of the equipment, but since even the best equipment won't provide consumer satisfaction without proper installation, it's your ability and reputation that get the lion's share of the selling copy.

If you're interested in building **YOUR** business, send the coupon for a copy of Century's unique promotion story. There's no obligation.



JERRY JOHNSON, Sales Manager
Century Engineering Corp., Cedar Rapids, Iowa

Rush me your
promotion story.

Have your sales
representative call.

NAME.....

COMPANY.....

ADDRESS.....

CITY..... STATE.....

Contractor

Wholesaler

Mfrs. Rep.

